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THE MONTH

The Symposium

SOME time ago we received a letter from a reader in Scotland, complaining about how inadequate and in many respects out of date first-aid manuals were from the point of view of the general practitioner. He therefore asked whether we would publish a symposium on the subject which would not only allow him to give adequate first aid himself, but also help him to teach others. The symposium this month, on 'First Aid in General Practice', is the direct consequence of this letter. In it we have sought the aid of the experts in bringing to our readers authoritative yet practical advice on how to deal with most of the emergencies which the general practitioner is likely to encounter during the course of his daily round. The subject is a particularly important one at the present moment, as it is becoming increasingly clear that the general practitioner will occupy a key position in the National Accident Service which the country must have sooner or later. No matter how efficient our accident centres may be, many a life will depend upon the first-aid treatment which the casualty receives from the general practitioner at the site of the accident.

Medical Manpower

'ABOUT 2.5 million people—one out of every thirty persons employed in this country—work at maintaining the nation's health. The 1960 Census may very well show that, within the last decade, the health field has risen from seventh to third place among major U.S. industries in terms of numbers of persons employed'. Such is the somewhat startling announcement made in a recent bulletin issued by the Health Information Foundation of New York. Granted that the figures quoted include pharmacists, opticians, hospital attendants and attendants in doctors' and dentists' surgeries but, even so, they must give rise to a certain amount of concern. Is the maintenance of health becoming such a vested interest that future generations will be unable to grow up in a normal manner? Here surely arises the makings of one of the greatest neuroses of all time, worthy of the pen of an Orwell.

On a more plebeian level the figures given for doctors are of special interest. Although the number of doctors has almost doubled since 1900 (119,749 to 236,089), the ratio per 100,000 population has fallen from 157 to 133, and it is expected to fall to 126 by 1975. The number of full-time specialists practically quadrupled between 1931 (22,158) and 1959 (over 81,000) and, in addition, in 1959 there were 21,786 part-time specialists. An interesting side-light on conditions of practice in the United States today is the comment: 'The essential role of the family physician is presently

being filled not only by general practitioners, but to a degree by such specialists as internists for adults in the family and pædiatricians for children'. Equally significant is the fact that between 1931 and 1959 the proportion of doctors in the Federal Government service rose from 2.5 to 7.4 per cent. of all doctors, and 4,525 of these were employed by the Veterans Administration.

'Disposable Items'

'THE wind of change is blowing through the hospital world and new ideas are being more readily accepted', according to Mr. John A. Myers, group chief pharmacist, Royal Infirmary of Edinburgh, in an article reviewing the increasing use of disposable items in hospital (*Pharm. J.*, 1961, **186**, 245). The list of such items now available is certainly a formidable one. The paper industry alone supplies a wide range, including surgeons' coats, bedding, examination couch covers, sputum cups and goose-neck urinals. The range offered by the plastic industry is equally varied, covering sterile syringes, gloves, intravenous perfusion sets, catheters and colostomy bags, whilst the rubber industry now supplies disposable surgeons' gloves and catheters. Even the metal industry has its list of disposable items, made partially or completely of metal.

There are two major arguments in favour of such disposable items. The first is that they reduce the risk of infection. The second is that they reduce the amount of labour—and this today is becoming a paramount consideration in any organization. As Mr. Myers points out, around 60 per cent. of all hospital expenditure is on salaries and wages, 'so that anything that cuts down labour requirements economically and efficiently is likely to recommend itself'. By the increasing use of disposable items laundering costs could be cut by a considerable amount, not to mention the skilled and semi-skilled labour required in an efficient sterilizing department. There are, of course, disadvantages. Last year, for instance, hospital demands for machine-made gauze swabs in the United Kingdom rose to such a peak that the manufacturers could not meet the demand and many hospitals were out of stock for several weeks. This, obviously, is a state of affairs which cannot be tolerated. Over-all, however, there can be little doubt that disposable items have come to stay, and hospitals and manufacturers will need to adjust themselves to meet this new phenomenon.

Marine Hygiene

THE sailor's lot is a much happier one than it was but, according to P. B. Cook (*J. Roy. Inst. Publ. Hlth*, 1961, **24**, 31), it is not yet all it should be. Even in the management of venereal disease 'much more remains to be done'. 'Organization of continuation treatment is still poor and there is little in the way of education or moral guidance'. A word of praise is given to German port health authorities who have persuaded municipal authorities to provide social centres 'to rival the attractions of dockside bars'. An aspect of alcoholism among sailors to which attention is drawn. and which is probably not widely

appreciated, is that the incidence is much higher among senior officers—captains, chief officers and chief engineers—than in any other occupational group. This is attributed to the fact that 'nobody may be more lonely' than these and, 'unable to relax lest their authority should be undermined or their friendship abused, they take to their cabins and drink alone'. One method to overcome this is 'the increasing tendency for senior officers to be allowed to take their wives to sea for varying proportions of their service'.

Inevitably, criticism is levelled at the standard of ships' surgeons—'the quality is variable, but the average is not high'. The holder of such office may be 'a retired specialist, newly qualified or a histologist . . . It could not be claimed that a retired radiologist would be the ideal holder of a post requiring the performance of tracheotomy in the South Pacific'. To overcome this difficulty, it is suggested that all medical personnel might be recruited centrally, 'possibly by the existing Shipping Federation but preferably by a new body to be responsible in the most general sense for the provision of medical services in the mercantile marine. The responsibilities would include the examination and selection of crew, research, and the provision of sea-going medical officers for ships'. A glaring anomaly at the present moment is that a sailor goes to sea without BCG vaccination, Schick testing, or protection against tetanus or poliomyelitis. All these should be made compulsory in order to reduce to a minimum the risk, for instance, of an epidemic of poliomyelitis breaking out while a ship is at sea.

A Model Prison for Drug Addicts

Hong Kong, with its 200,000 drug addicts in a population of three million, probably has the highest incidence of drug addiction in the world. It is estimated that at least £10.6 million a year is spent on heroin and opium. The reason for this high incidence, of course, is that Hong Kong is a free port, possessing entrepôt facilities designed to encourage the freest possible flow of regional trade. Inevitably this freedom of movement is exploited by international traffickers in narcotic drugs. Needless to say, drug addiction is most pronounced among the criminal element in the population, and by 1958, 60 per cent. of all prisoners convicted in Hong Kong were on drug charges—addicts or traffickers.

Faced with this problem, the authorities decided to open a special prison for the rehabilitation of addicts at a site some 16 miles from Kowloon, and an interesting account of the first year's working is published in *Bulletin on Narcotics* (1961, **13**, 13). Of the 680 prisoners in residence, more than 70 per cent. were convicted for possession of heroin; most of the remainder for possessing barbiturates and only a very few for possessing opium. The majority were between 20 and 40 years of age. About 20 per cent. had tuberculosis. The prison is divided into three sections: the hospital, a light-labour section, and a full-labour section. In the physical rehabilitation programme the aim is threefold: (a) to free the prisoner of his addiction; (b) to treat any complicating disease; (c) to rebuild physical strength and

bring it up to normal standard. From the start the rehabilitation programme has been 'energetic and positive, because it is felt that the provision of the right kind of work is the key to rehabilitation'. As much as possible of this work is done out of doors, and two of the major activities have been afforestation and flood protection works. Although it is too early to assess the full value of this commendable project, a review of the 1,388 prisoners discharged during the first year of its existence shows that only 65 were reconvicted. Equally impressive is the marked improvement in the physical well-being of the prisoners—with gains in weight, for instance, of around 12 to 16 pounds (5.5 to 7 kg.).

Child Suicide

WHETHER or not, as a recent Japanese report suggests, 'most child psychologists are not particularly interested in whether there are any cases of suicide among children' may be debatable, but there is increasing evidence that suicide and attempted suicide among children are more common than is generally recognized. According to a speaker at the third World Congress on Psychiatry in Montreal last month, more than one in ten of all children and adolescents up to the age of sixteen admitted to a New York hospital in 1960 were attempted or threatened suicides. For the purpose of the Japanese report, Tadahiko Oki and his colleagues (*Bull. Osaka med. Sch.*, 1960, **6**, 86) have analysed the reports of child suicide appearing in two Japanese newspapers between January 1946 and September 1958.

There were 73 such cases, and the sex incidence was practically two boys to one girl, which is said to be the same sex-ratio as for suicides in adults in Japan. The youngest was a seven-year-old boy, and the number suddenly increased with the onset of puberty, reaching a maximum of 27 at 15—the latest age included in the series. Although no detailed analysis of motivation was available, the commonest apparent causes—or, at least, precipitating factors—were 'domestic turmoil' and 'scolding'. The former was held responsible for 23.1 per cent. of the suicides among boys and 16 per cent. of those among girls, while the latter was held responsible for 21 per cent. of those among boys and 20 per cent. of those among girls. An interesting sex difference, although the difference need not necessarily be of any great significance in view of the small numbers involved, is that 'pain due to physical illness' was a more common cause among girls (16 per cent.) than among boys (4.2 per cent.). Perhaps the most morbidly interesting point brought out by this analysis is that, unlike adults who 'are inclined to avoid cruel means and adopt the easiest way to death', children 'commit suicide suddenly and impulsively with cruel means'. Thus, the commonest means of suicide among boys (39.9 per cent.) was 'throwing oneself under a train', followed by hanging (25.2 per cent.). In the case of girls the commonest method was poisoning (52 per cent.), followed by 'throwing oneself under a train' (20 per cent.). Perhaps the most unpleasant case of all was the 15-year-old boy who killed himself by drinking petrol, pouring it all over his body and then setting fire to himself.

FIRST-AID TREATMENT OF HEAD AND SPINAL INJURIES

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THERE is no more difficult subject to write on than the first-aid treatment of head and spinal injuries, and for certain obvious reasons. A doctor may arrive at the scene of an accident by chance, with no medical facilities of any kind. On the other hand, he may be officially called and able to travel with some equipment rapidly assembled that might or might not turn out to be adequate.

THE PROBLEM

Partly in order to 'hot up' this introduction and partly to declare our awareness of the need for realism, let us give the gist of some of our conversations with our doctor colleagues and friends when discussing this subject of first aid in accident surgery.

'What happens when a man like me, in a single-handed practice, is busy with a midwifery case?'

'It is not possible for general practitioners to give a comprehensive service, it would not be economic'.

'However willing I might be to give such a service, it would be quite impossible'.

'Who pays, and who supplies the equipment?'

From the other side we hear of many who are anxious fully to cooperate and, if they were shown the way, would be only too glad to do so. Even they, however, are apt to feel that an ambulance will soon be on the spot with its attendants, leaving them little to do. Certainly in the past, without full facilities, medical men have rapidly appraised the situation of an accident and have acted expeditiously, wisely and usefully. Many, however, are not happy with what they have been able to do at the time and, indeed, have felt not only a sense of frustration but occasionally of embarrassment. Certainly many well-known and excellent first-aid manuals are in circulation. None the less, the fact remains that we, the specialists, have been requested by the general practitioners to write on the subject of first aid and we feel that this is an indication that when the circumstances arise they want to be in a position to do more.

In the new Regional Accident Service that is envisaged, the regional plan is to have a central accident institute sited within a general hospital. This institute will coordinate the services of the region and will work in association with accident units in other hospitals. In many instances, however, geography will demand that there shall be a peripheral outpost for the treatment of trauma and this will have to be staffed by general practitioners.

This outpost might well have to be sited in a general practitioner's surgery.

The basis of this article is that a doctor has been called to a motor car accident on the road and that he is prepared medically to cope with certain emergencies.

APPRAISAL OF THE CIRCUMSTANCES

On arrival at the site of the accident appraisal of the circumstances usually can be made rapidly. It will be seen almost at a glance whether the accident is simple or complex and whether the injuries are trivial or dangerous.

A patient may:—

(1) Have freed himself from possible wreckage.
(2) Be within the wreckage but easily capable of being lifted out.
(3) Be pinned tightly within the wreckage and immovable without special aids.

In all three cases, by the time the doctor arrives a patient may or may not be unconscious and two questions will have to be asked and answered.

(1) Can I act usefully without help?
(2) If I need help do I go myself and seek aid or wait and send somebody else for it?

CONTACT WITH THE PATIENT

It is wrong to assume that a patient is unconscious even though his eyes are closed, his skin pale and his face expressionless. It is a golden rule always first to speak gently to an injured patient, to reassure him if conscious and to find out whether or not he is paralysed. A conscious patient, even when pinned down, usually knows whether or not his limbs are dead. Also, he can make known the severity of his pain and whether drugs are immediately needed to give relief. There is nothing more terrifying for a slightly dazed patient than to be dragged out of a car without verbal contact being made with him. On the other hand, it is extremely comforting to a conscious patient with a severe spinal injury to know that he has fallen into the hands of someone medically knowledgeable and that skilled help has already been or will be sent for. We cannot over-stress the importance of this first contact with the patient.

PROVISION OF AN AIRWAY

In concussion any degree of cerebral anoxia, however slight, jeopardizes survival or full recovery. Unfortunately, obstruction to breathing is particularly liable to occur when consciousness is impaired as the result of the falling back of the tongue and the accumulation of blood and vomitus in the mouth and throat. Indeed, so important is the need for a free airway in the head injured that at least adequate preparation for the cleaning of the mouth and throat should always be made. A mouth gag and swabs carried on suitable holders are a minimal need. When there are no contraindications, such as a fractured spine, a patient may be turned on to his side with his jaw held forwards and his head pointing downwards so as to allow accumulations of fluid in his mouth and throat to drain away by gravity. In the highly organized team, suction will be necessary even as a first-aid

measure. Also, when facilities are adequate and the needs imperative, a tracheostomy might have to be done in a surgical outpost and this should not be beyond the skill of a specially trained general practitioner.

SENDING FOR AID

By the time a doctor arrives at the scene of an accident the ambulance service may already have been informed of the happening and aid be already on the way. If not, then a quick decision has to be made whether or not the ambulance should be sent for. It should not be assumed that the ambulance alert has been forwarded, otherwise much valuable time might be lost. When telephone messages have to be sent it is usually better for the doctor to remain with the patient if someone else can carry out this commission. When alone a doctor is sometimes confronted with the difficult decision of whether to go and summon help and leave the patient alone, or to stay with the patient. With few exceptions it is best, after making the patient as comfortable and as warm as possible to go and summon help. When a patient has been concussed, say in a mountain fall, it is better to wait for quarter- to half-an-hour before leaving, since the patient may recover and, in a state of confusion, roam into danger.

The telephone number of the Accident Service is 999. If the patient is pinned and special aids for his release are necessary then the Fire Service should also be informed. The special problem of mountain rescue is covered in the booklet 'Mountain Rescue, Cave Rescue, 1960', issued by the Mountain Rescue Committee, Hill House, Cheadle Hulme, Stockport, Cheshire. Most industries have their own first-aid arrangements.

Finally, it would repay anyone to become acquainted with the telephonic arrangements of the various road associations such as the A.A., the R.A.C., and the R.S.A.C.

SHOCK

The medical and surgical first principles of shock govern any such state that may follow head or spinal injuries. In concussion, shock is not often a substantial factor, whereas in spinal injuries it may well be, depending on the severity and the amount of pain. Blood loss in these two conditions is usually small and it is rarely necessary to administer a blood transfusion on the spot.

RELIEF OF PAIN

In cranio-cerebral injuries unassociated with damage elsewhere in the body, the need for morphine is very rare indeed, the only indication being truculence or restlessness, dangerous to the patient, that cannot be controlled by reasonable restraint or persuasion. The disadvantage of morphine is that it tends to obscure neurological signs that later might be so vital in the diagnosis of a middle meningeal hæmorrhage. Moreover, it causes respiratory depression. It is important to know that a restless patient, not doing himself harm, may become far more restless by resisting his movements.

There is no harm in letting a concussed patient move from side to side or sit up if he shows the inclination to do so.

In spinal injuries, on the other hand, and particularly when patients are trapped, it is often merciful to administer morphine, not only to allay pain but apprehension. The lot of a patient being carried from the mountain can be substantially eased by the administration of a suitable drug. There is no great harm in giving sedation to a lightly concussed patient if he is severely injured elsewhere in the body so long as a correct record is attached of the administrations.

EXTRICATION AND TRANSPORT

Concussion.—In states of concussion a patient may safely be pulled or lifted from a car and laid comfortably on the verge away from the danger of oncoming traffic. He may be carried to a nearby house and nursed there until the ambulance arrives. As a rule it is not wise to transport an unconscious patient to a hospital in a private car. On the other hand, if an ambulance is not likely to arrive for a considerable time and the patient is merely dazed, there is no reason why he should not be.

Spinal injuries.—When extricating, lifting or transporting a patient with a spinal injury the danger is that a simple spinal column break or dislocation may be converted into an irreversible injury on the hitherto undamaged spinal cord. With this possibility in mind a pinned man should be very carefully removed from wreckage and never bundled roughly out of a motor car. Transport should always be by a stretcher, formal or improvised. As there is usually greater danger in a position of flexion than of extension in fractured spines, whenever there is any doubt and a man has to be carried, this should be done face downwards. In mountain rescues it is extremely dangerous to move a man with a fractured spine other than by stretcher.

When a patient is severely trapped it is usually wiser, if there be no danger of fire or explosion, to leave the extrication to the special services of the Fire Brigade. Precipitate interference is rarely needed. Again we would like to call attention to the danger of oncoming traffic when succouring the injured by the roadside. When it is suspected that the cervical spine has been fractured a little traction should be put on the head with the hands when the patient is moved and on the stretcher his head should be settled in a comfortable position and supported with sandbags or whatever support is handy.

In general terms, patients with head and spinal injuries can usually be left safely at the site of accident, or nearby house or surgical outpost, until arrangements can be made for their transfer to a hospital that is staffed to receive and treat these particular types of injury. In spinal-cord injuries, whenever there is any likelihood of delay every effort should be made to protect the skin by making sure that the weight of the patient is uniformly distributed and that his clothes are not ruffled into hard ridges.

SCALP WOUNDS AND COMPOUND FRACTURES OF THE SKULL

As a rule, scalp wounds, however severe, usually stop bleeding by natural processes and though a patient may lose much blood he rarely bleeds to death. Spurting, however, may be persistent and in such cases bleeding may best be stopped by sutures passed through all the layers of the scalp and the edges of the wound pulled lightly together. The skin may be pulled over a sterile pad placed in the wound. In most open wounds, all that is necessary is to cover the area with a sterile pad and to bandage the head lightly. Heavy pressure, of course, is dangerous as bone or foreign bodies may be driven into the brain from the surface. Any kind of exploration by the finger or any other method in first-aid stages is to be deprecated.

When once a patient has been carried to a first-aid post no scalp wound should be firmly repaired until the doctor is satisfied that all foreign material has been removed from the depth of the wound and that there is no associated depressed fracture of the skull. In all cases in which definitive surgery has been carried out it is wisest to carry out an x-ray later to make sure that the skull has not been fractured and pieces of bone driven into the brain.

BLEEDING FROM THE EAR AND NOSE

Bleeding from the ear.—All that is necessary is to put a sterile bandage over the ear. It is quite unnecessary to plug the external auditory meatus.

Bleeding from the nose.—Save in very severe bleeding it is best not to pack the nose. If, however, packing is thought to be necessary this should be very lightly done and the packing should not be left in for more than one to two hours because of the danger of causing infection and meningitis. Indeed, in most bleedings from the ear or from the nose it is usually best to leave well alone.

ANTIBIOTICS

If suitable precautions are not taken one of the commonest causes of death in head injuries is septic meningitis and encephalitis resulting from internal compound fracturing of the skull. As a rule the prophylactic administration of antibiotics may safely be left to the hospital that is going to receive the injured. In those cases, however, in which there is likely to be delay, and particularly when there is evidence of paranasal sinus fracture, as shown by severe bleeding or specifically by cerebrospinal fluid leakages, a course of chemotherapy should be started immediately. Again, information of any such medication should always be forwarded in detail to the receiving hospital.

CONCLUSION

Finally, we would like to state once again that if the general practitioner is properly to take his part in any Accident Service, and he must if this Service is to function properly, first-aid facilities will have to be overhauled firmly and realistically.

FIRST-AID TREATMENT OF SPRAINS AND FRACTURES OF THE LIMBS

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THERE is much useful work to be done in this field to assist those who have suffered minor injuries, and require important but not vital assistance; and those for whom the quality of the first aid given may greatly influence the degree of disability, or even their survival. Those at present called upon to do most of this teaching—the general practitioners—are themselves self-taught since qualification, as little if any time is devoted to this subject in the medical curriculum.

CLASSIFICATION

The incidents requiring first aid fall into two broad categories:—

(1) Those in which the injury is minor, the disturbance principally social, and the measures required within the scope of anyone with a smattering of first aid, and a good supply of common sense.

(2) Those in which some serious injury has befallen one or more individuals. To render the proper assistance quickly and effectively in these circumstances requires all the skill and ingenuity that any of us can muster.

WOUNDS

In dealing with serious extremity injuries the first consideration is whether or not these are accompanied by a wound, and are in fact compound sprains, dislocations or fractures. The general principles governing first aid for the wound are the same whatever part of the extremity is involved, and might therefore be dealt with first before discussing individual injuries. The objects of attention to the wound are to avoid blood loss, and to minimize the danger of infection. Both these are best achieved in most instances by the application of the cleanest available dressing, and a firm bandage. Massive hæmorrhage from a recognized site may require more active measures, and local pressure should be the next line of defence.

Fortunately, it now seems to be generally agreed that there is little or no place for the tourniquet in first-aid measures for the extremities. If there is a bland antiseptic available, in which to soak the dressings to be applied to the wound, there would be an obvious advantage in using this. In this category could be included such solutions as chlorhexidine and cetrimide. I would emphasize that in serious injuries speed is of great importance, and to labour doing protracted first-aid measures at the roadside, or in the factory, is a mistake when the hospital is close by.

In minor injuries it is difficult, and in some respects unnecessary, to dis-

tinguish between first-aid and definitive treatment. This applies to both wounds and injuries. They should, whenever possible, follow one into the other, with as little disturbance to the patient as possible. For example, a sprained ankle which has been effectively strapped with U-shaped zinc oxide strapping can be x-rayed without removing it—with certainty that no fracture in the ankle, which requires more treatment, will be missed. If 'elastoplast' has been rolled around the ankle and foot, it will have to be removed before assessment and treatment can be undertaken.

When the distortion of any part of a limb indicates that a fracture or dislocation has taken place, an attempt should be made to assess the site and variety of the displacement. This should include the presence or absence of any vascular or nerve injury. In the absence of a wound it is unlikely that either of these will materially affect the first-aid measures. The presence of either would make more urgent the application of definitive measures. The knowledge that a nerve injury has been present from the time of injury may be of great assistance in determining subsequent treatment.

THE SHOULDER AND HUMERUS

Around *the shoulder* an obvious deformity, associated with relatively little swelling and no severe pain at rest, is probably a dislocation. This may be confirmed by the flattening of the shoulder and the head of the humerus being palpable anteriorly or occasionally posteriorly. The patient may be able to give a history of previous dislocations, in which case the reduction may be relatively easy—either by the Kocher method, or by gentle traction. If it is a 'first' dislocation, reduction may still be easy by these methods—for the first ten to fifteen minutes after it has taken place. After that muscle spasm may prevent reduction except under anæsthesia. After reduction an ordinary sling inside the clothes should be provided, and the patient advised to continue its use for three weeks. If there is clinical evidence of bony injury around the shoulder, the most effective measure is to use the collar-and-cuff type of sling, which can easily be made from a tie or scarf, and some type of body bandage to reduce movement of the arm. Two types of injury in this region which require a triangular sling, with support at the elbow, are fractures of the clavicle and injuries to the acromio-clavicular joint. The first of these will be easily recognized by palpation; the second will not be evident when the patient is lying down, but can be seen as a prominence of the outer end of the clavicle when the patient sits up, and the weight of the arm opens the dislocation.

Fractures of the shaft of the *humerus* are also best dealt with by the collar-and-cuff sling and the body bandage. The body bandage should be more firmly applied and, where something suitable is available, a soft pad should be placed between the arm and the body—from the axilla to the elbow. The weight of the arm hanging from the wrist provides gentle con-

tinuous traction on the fracture site, and assists the splintage. Apart from the body bandage, no other splintage is required in the first-aid treatment of fractures of the humeral shaft.

THE ELBOW

The age of the patient is important in the diagnosis of injuries around the elbow. Generally speaking, uncomplicated dislocations are more common in adults, and fractures into the joint and above the joint more common in children. When there is significant doubt about the diagnosis, the position of the arm should be disturbed as little as possible: the arm should be splinted as it lies, and the patient hustled to the x-ray department. Attempts to flex a supracondylar fracture, or an anterior dislocation of the elbow, to put it in a sling may do further damage, and are to be avoided. Even when a clinical diagnosis of a dislocated elbow can be made with reasonable confidence, it is unlikely to be reducible without an anæsthetic; a check x-ray is essential to rule out minor fractures, and a period of three weeks in plaster after reduction is desirable. Minor fractures, such as those of the medial and lateral condyle, the head of the radius, and the coronoid process, are usually diagnosable only by x-ray examination; the elbow will be swollen but not usually distorted, and a triangular sling provides adequate first-aid treatment. The 'pulled' elbow is an injury which is more common than is usually appreciated; the history of the onset of the trouble may be of some help. The typical clinical picture is that of a child—usually about 5—in considerable pain, with the elbow held just below a right-angle, and the forearm in some pronation. There is usually little swelling or other local signs. If the child's attention can be distracted a quick twist into supination will usually reduce the subluxation of the radial head, and relieve the symptoms.

THE FOREARM AND WRIST

With fractures of both bones of the *forearm* the object of first-aid measures is to prevent further displacement. If possible the method of choice is to apply firm, gentle traction in the line of the limb, with the hand in the neutral (mid-rotated) position. When plaster is available a slab should be applied from axilla to hand in this position, and bandaged in position. Obviously this will seldom be available in first-aid circumstances, and there will be need to improvise with whatever other suitable material is at hand. If no straight arm splintage can be adopted, a firm support should be put around the forearm before a sling is applied, as an unsupported sling encourages displacement.

With injuries around the *wrist* it is well to remember that sprains of the wrist are uncommon at any age. Injury in this area, of sufficient severity to require first-aid measures or to lead the patient to consult his doctor, should arouse strong suspicions that a fracture is present, and be managed

accordingly. Early splintage of obvious fractures is essential to avoid further displacement, swelling and pain; early definitive treatment is desirable for the same reason.

The most common injury is the Colles type of fracture, or fracture separation of the epiphysis in the young. No special equipment is required to splint this type of injury. A suitably padded splint can readily be improvised from any stiff material, such as paper, magazine or wood. A protection of this type, firmly bandaged on to the limb and supported by a triangular sling, is all that is required. Injuries to the carpal and metacarpal bones should be dealt with along similar lines if clinical examination suggests that there is bony injury.

THE HAND

Injuries to fingers and thumb, involving joints or tendons, require special mention. Immediate reduction of interphalangeal dislocations is usually possible by simple traction; after reduction, protection of the joint for a sufficient period to allow healing of the soft-tissue injury is essential. The fact that this is not sufficiently practised leads to much persistent and unnecessary disability. The swollen, warm and uncomfortable joint is too often subjected to heat and active mobilization, instead of being given the rest and protection of which it is obviously in need. Tendon injuries are usually associated with open wounds. These may be apparently insignificant, and the presence of any penetrating or lacerated wound in this area should put the examiner on his guard against missing injury to tendon or neurovascular bundle. One difficulty about the immediate diagnosis of nerve lesions is the unexplained phenomenon by which detectable loss of sensation may be delayed for some hours after injury. In lacerations about the wrist it is not uncommon for careful testing to fail to reveal the presence of damage to a main nerve which is discovered at operation.

Two types of closed injury to tendons are particularly likely to give rise to trouble at a later date. They are the mallet finger and the central slip tear of the extensor mechanism. The mallet finger may well have a fracture of the base of the phalanx, as well as the rupture of the tendon. Immediate and effective splintage of the distal joint in full extension is essential, and should be maintained continuously for at least four weeks. If a fracture is present, operative replacement or removal of the fragment may be indicated. The central slip deformity is more difficult to diagnose at the early stage, but consists of inability to extend the proximal interphalangeal joint fully. Immediate effective splintage of this joint in full extension often removes the necessity for repair of the tendon later.

Spontaneous rupture of extensor, and avulsion of flexor, tendons are rare injuries in which immediate recognition and splintage and early surgery offer the best results. The best first-aid measure for finger injuries in which a phalangeal fracture is suspected is to bandage the finger to the one next to it, as a preliminary to x-raying.

THE HIP AND FEMUR

Injuries around *the hip* are, of course, most common in the elderly, in whom they often occur with little or no violence. Injuries in this area, when they occur in younger age-groups, do so as a result of considerable violence, except when they have some pathological basis, as in adolescent slipped epiphysis. First-aid measures in this type of injury present no difficulty, principally because the splint is readily available; pads between the legs and the legs tied firmly together are all that are required. This measure is essential; elderly people suffer unnecessarily, and increased damage may be done to the fracture if they are moved about and transported without splintage.

Fractures of the *femoral shaft* can often best be managed in this way. If this method is used the bandaging of the legs must be more carefully and effectively carried out than for the hip injuries. On this will depend the control of the muscle spasm which produces the pain and increases the deformity. A useful addition to this is the fixing of a rigid splint to the other side of the injured leg, which extends upward to the trunk and chest, and can be fixed to the body: preferably with a broad strap or a scarf or towel, if no strap is available. This is the old Liston splint and, if properly applied, will often decrease the pain of movement and travel. The Thomas splint is now seldom used as a first-aid measure; it is not carried in ambulances, and it is only used in special circumstances—such as mountain rescue or pit accidents—where it will be taken to the scene of the accident. When it can be applied early, and suitably fixed, it is by far the best means of control of this injury, particularly if the patient has to be moved any distance. The business of applying the splint should be preceded by a sufficient period of gentle continuous traction to overcome the spasm, and this traction should be maintained until the limb is firmly bandaged on to the splint. If the end of the splint can be fixed to the shoe or boot, then the traction can best be maintained by elevating the limb, and using the body weight as counter-pull.

THE KNEE, TIBIA AND FIBULA

Injuries to the *knee-joint* can be divided into three groups: (1) displacement of the menisci, (2) damage to the extensor apparatus, (3) instability of the joint associated with damage, which may be to ligament or bone, or both. In the first two of these, first aid may include reduction of the cause of the internal derangement. In cartilage lesions the mechanism of injury and the history may clearly indicate the cause, and the patient may even be able to give instructions as to the best method of reduction. The usual procedure is to flex the joint fully, open it by straining the tibia, and rotate it away from the side involved, and gradually extend the joint. If this manœuvre fails to achieve full extension, it may occasionally be helped by rotation in both directions, with the joint at a right-angle. Lesions of the extensor

apparatus are more common in females; the most frequent is lateral dislocation of the patella. This can usually be reduced by firm lateral pressure on the patella, with the knee straight. This is usually the kindest thing to do if it is seen early, as reduction leads to immediate relief of pain and spasm. A suspected fracture of the patella, or rupture of the extensor mechanism, should be splinted with the knee straight. The third variety should be x-rayed at an early stage to rule out bony injury. If splintage is required there is little difficulty in improvising one for the knee; usually in the common sprains and internal derangements a crêpe bandage is sufficient.

Fractures of the *tibia and fibula* present little difficulty in relation to first aid. In closed injuries a firm gentle pull along the line of the limb—maintained while pads are placed between the legs, and the legs firmly bandaged together, including particularly the knees and the feet—is adequate. If any suitable rigid splint is available it should be included on the outer side of the injured leg. In compound factures—as elsewhere—the leg should be bandaged as it lies, and no attempt made to reduce the fracture.

THE ANKLE AND FOOT

Sprains of *the ankle* are the cause of much disability—often because the primary injury is inadequately treated. The external lateral ligament is most commonly affected, and when it is completely torn the joint is quite unstable, and open repair is usually required. When there is doubt about the completeness of the tear plaster is indicated, followed by suitable strapping if the tear proves to have been incomplete. A severe sprain is a more serious injury than an undisplaced fracture, and seldom gets the attention it requires. In malleolar fractures a firm bandage is required to prevent further displacement and damage to soft tissues. This should include some form of improvised splint if there is obvious instability between the foot and the leg, as is present in bi-malleolar fractures.

The same type of protection is all that is required for injuries to *the foot*. Toes should be managed in the same way as fingers. The small toes can be adequately splinted by bandage or strapping to neighbouring toes. The great toe is injured more commonly than the others, and for soft-tissue injuries or minor fractures the protection of a collodion splint is usually all that is required. Trephining of the base of the nail is a useful method of relief of the pain resulting from any subungual hæmatoma, and may prevent loss of the nail. Tendon injuries around the foot are almost always associated with wounds, with the exception of the tendo achillis. Spontaneous rupture of this tendon at the musculo-tendinous junction is more common than is generally appreciated. First-aid measures are designed to prevent any forced dorsiflexion of the foot, and early operative repair of the tendon is indicated.

FIRST-AID TREATMENT OF BURNS AND SCALDS

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Strictly speaking, first aid in burns and scalds refers to the preliminary skilled help given to an injured person before the arrival of a doctor but today the term covers all aspects of prevention, including the therapy instituted by the practitioner before the patient is referred to hospital.

A burn injury caused by heat, caustic materials or electrical agents results in both general and local effects. Of the general effects, decreased circulatory plasma volume is the most important, whilst local effects include tissue damage or necrosis and œdema from increased permeability of vessels. Skin is the tissue most commonly involved but in flame burns there is the possibility of irritation or damage, from inhalation of noxious fumes, to the mucous lining of the bronchial tree.

DEGREES OF SEVERITY

Many domestic burns are minor and insignificant, but there are also many potentially serious injuries. As a measure of severity, burns can be graded both from the 'area' of the body surface involved and from their 'depth'. From an estimation of 'area' an assessment can be made of the transfusion requirements, whilst from an estimation of 'depth', a guide is obtained of the amount of hospital surgical treatment that will be required.

Area.—The immediate outcome of a burn injury is determined by its area. To estimate the burnt area as a percentage of the total body surface the 'Rule of Nine' has been adopted (fig. 1). The greater the extent then the more seriously ill from plasma loss will the victim rapidly become and the more urgent is his prompt removal to hospital. A casualty with burns involving an area equal to or greater than that of a whole arm will lose so much of his circulating plasma volume that transfusion is necessary to counter the resultant shock and hypoxia of tissues.

Depth.—Burns and scalds are classified as *superficial* and *deep*.

(a) *Superficial burns* are usually the result of scalds or explosions. The surface layers only of the skin are involved and healing occurs from the epithelial cells of the deeper layers. The scalded skin looks fiery red with blistered portions. Pain may be severe, especially if the affected area is subjected to variations of temperature. As healing in uncomplicated cases is rapid and without scarring, nothing must be done in first aid that will delay or disturb the natural healing process.

(b) *Deep burns* usually result from flame or from rather prolonged application of hot fluids or caustics. All layers of the skin are destroyed and the tissue injury may extend to fat, muscle and bone. The burnt tissue looks dead white or is tanned brown and depressed. Coagulated vessels can be seen in the eschar. Local pain is often absent as cutaneous nerve endings have been destroyed. Healing is slow and scarring and deformity are a natural outcome unless prevented by early surgery: i.e. skin grafting. The quicker patients with this type of burn are transferred to hospital the better as infection is a common complication and this would delay reconstructive surgery.

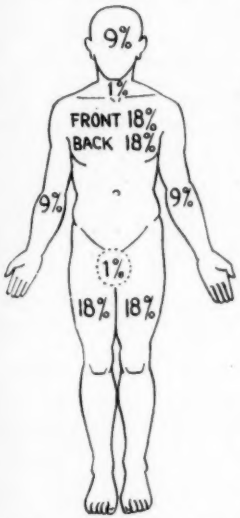

FIG. 1.—The Rule of Nine.

Burns of the face (especially the eyes and the eyelids) require special supervision. If superficial in type, and infection supervenes, the burn from further skin destruction becomes deep and, on healing, disfigurement and deformity result. Deep burns of the face, and also of the hands, require special surgical care and patients with burns with these distributions and depths must be referred immediately to hospital to prevent deformities such as ectropion of eyelids and lips, microstoma, crippled or frozen hands.

NATURE AND DISTRIBUTION OF BURNS

Flame burns are commoner in the female from clothes catching fire. They are usually deep and involve the lower trunk, upper thighs and genitalia. If more extensive, the whole trunk and face are involved and there may be irritation of the bronchial tree. The possibility of associated carbon monoxide poisoning must be considered.

Scalds are commoner in children and are usually but not always superficial. They vary in site and extent but are most common on the face, neck and upper half of the anterior trunk.

Electric burns.—There are three effects of electricity:—

(a) The current itself may cause 'electric shock'. This form may be complicated with injuries resulting from a fall from a height, plus the necrotic damage from contact with the burn or ignited clothes.

(b) The intense light may set fire to the clothes or injure the eye.

(c) Heat may lead to (i) electrical necrosis of the tissues, (ii) burns from an arc, or (iii) contact burns (strictly speaking, thermal), often deep and sharply localized: e.g. in the hands of children from grasping hot electric elements.

Chemical burns of the skin are caused by the spilling of strong acids or caustics and can cause rapid deep damage to the skin. Phenol and lysol cause little damage if washed off immediately.

Epileptic burns.—Epilepsy is a frequent precipitating factor of burns in

adults. Commonly, they are deep flame burns affecting the face, head and extremities.

Atomic flash burns.—The flash is capable of causing superficial burns on the exposed parts of persons two miles from the epicentre. Secondary flame burns of the body can result from ignited clothing.

Mouth burns result from the drinking of lysol or phenol, or from acids or alkalis.

Burns of the stomach (*and œsophagus*) are the result of swallowing the cresol antiseptics or acids or alkalis. Ferrous sulphate tablets can also cause rapid corrosion.

FIRST AID

The term 'first aid' has different meanings. In the first place, it should include 'anticipatory first aid' or 'accident prevention', or 'accident awareness'. In the second place, it covers rescue procedures. It also describes a system of dogmatic elementary instruction for laymen to enable them to deal with a medical emergency until a doctor arrives. In addition, it describes the application of qualified medical knowledge under conditions of great urgency. There is a third sense of the term which conveys the advanced medical instruction for laymen who are likely to be responsible when no doctor is available: e.g. captains of small ocean-going merchant vessels (Patey, 1958).

ANTICIPATORY FIRST AID OR ACCIDENT PREVENTION

In peace time the vast majority of burns and scalds are preventable. All medical practitioners should be conscious of their responsibilities in the reduction of preventable deaths. The mortality rates in infancy from infectious diseases and from malnutrition have shown dramatic reductions, but those from accidents, even with improved care, rise steadily. As physicians and surgeons, we must act for the common good, protect the very young and old, educate in schools, colleges, youth organizations, welfare associations and institutes and in first-aid organizations.

The following could be adopted as a course for 'anticipatory first aid' or 'accident prevention and accident awareness':—

SUGGESTIONS FOR WEEKLY LECTURE DEMONSTRATION (TWO TERMS)

First term:

(1) Introductory lecture indicating the multiple danger problems in the home.

(2) Lecture demonstration by Electricity Board: 'What is Electricity?'. Dangers. Switches, points, fires, cookers, lights.

(3) Lecture demonstration by Gas Board Authority: 'What is Gas?'. Dangers. Switches, cookers, fires.

(4) Lecture demonstration by a joiner—on household fittings: e.g. carpets, stairs, windows, table tops.

(5) Lecture demonstration by a plumber: e.g. on taps, sinks, baths, pipes.

(6) Lecture demonstration by a retailer of children's goods: e.g. on prams, toys, bedding, pillows, playpens, cups, saucers, pots and pans.

(7) Lecture demonstration by a health visitor or children's nurse: e.g. non-inflammable clothing, polythene bags.

(8) Lecture demonstration by a nurse in geriatrics: safe daily routine for the elderly.
(9) Lecture demonstration by a member of the Fire Service: 'What to do'—e.g. guards, chimneys. Protection for young, old, crippled, epileptics, etc.
(10) Lecture demonstration by a chemist: pills, poisons, etc.; by a gardener: injuries in garden, stings; by a doctor: what to do on holiday—e.g. sunburn, mountains, seashore.

Second term:

(1) Introductory lecture indicating the problems on the roads
(2) Talk by traffic police
(3) Talk by road driver
(4) Talk by private motorist
(5) Talk by pedestrian
(6) Talk by representative of motor trade
(7) Talk by member of Accident Prevention Council
(8) Talk by doctor: e.g. eyesight, hearing
(9) Questions and answers

RESCUE PROCEDURES IN BURNING ACCIDENTS

There is as a rule only one opportunity—that of the moment.

(1) *Patient trapped in burning room.*—The patient may have collapsed from inhalation of smoke, or be poisoned by carbon monoxide. Quick removal of the patient will be necessary to save his life. The rescuer ties a handkerchief soaked in water (or vinegar—one part, and water—three parts) around his nose and head, so that the broad part covers his nose and mouth. After taking several deep breaths he crawls along the floor of the room, seizes the patient and pulls or carries him to safety and, if necessary, applies artificial respiration (mouth-to-mouth). The hospital and police are notified immediately and the possible need for a cylinder of oxygen with 5 per cent. carbon dioxide is indicated.

(2) *Patient with clothes on fire.*—Since flames ascend, the injured person is laid down—forcibly if necessary—with the flames uppermost, and these are smothered with a coat, rug or blanket rather than extinguished by water.

(3) *Clothed patient scalded with hot fluid.*—The clothes affected should be *immediately* ripped off to reduce the time of application of the hot fluid to the skin surface. Even when the moist clothing cools it is best removed to reduce heat loss from the body.

(4) *Patient with electric shock and/or burn.*—The electric circuit is broken at once if there is an interrupter close at hand; if not, the body must be removed as soon as possible from contact with the live conductor. The body must not be touched with the hands unless protected by india-rubber gloves. If these are not available, the patient can be pulled off the live conductor by his coat-tail, if his clothes are not wet, or pushed off the wires with a broom handle. The rescuer, for additional precaution, can stand on a dry board or on a thick newspaper or bundle of sacking, or he can charge the body with his shoulder.

Once the body is pulled from the live conductor the case is treated as one of drowning. In many cases when persons receive electric shocks death is only apparent. With the prompt application of first aid many victims can be

revived. The method of resuscitation resorted to is artificial respiration; steady persistent effort is one of the essential conditions of successful attempts to restore animation. In cases of severe shock respiration is seldom established in under one hour, and three hours may be necessary to restore normal breathing. Artificial respiration is not stopped until the patient breathes normally or until a medical practitioner has pronounced life extinct.

(5) *Patients with scalds from burst steam boilers or pipes.*—The injured should be pulled free from the steam and the steam turned off. First aid should then be given as for a scald from hot fluid.

ASSESSMENT AND PLANNING OF FIRST-AID TREATMENT

At all times initial assistance must be planned as part of the whole treatment of the injured. Skilled attention is gentle, precise, purposive and swift although unhurried. In recent years, advances in the surgical care of the injured have been steady and in some ways dramatic, and some traditional first-aid procedures have become unacceptable. In this country one assumes that following an accident professional medical help will be available within a few minutes or, at the outside, a few hours.

In first aid the primary duty is assessment: whether the injury is serious or trivial. In a trivial injury the individual is reassured, anxiety relieved, and simple general and local treatment instituted. If the injury be serious an immediate decision on urgency of action is demanded. Life itself can be threatened in the early phases of burns in three ways: (1) acute loss of blood and plasma; (2) respiratory embarrassment, and (3) poisoning.

Loss of blood or plasma in burns.—Although the loss is not precipitous, as following division of an artery, there is undoubtedly a lack of appreciation of the rapidity with which the circulating plasma volume is reduced. Transfusion in a severe burn is an absolute emergency and transfer of the patient to hospital an urgency. A delay of one hour may well tilt the balance and lead to severe hypoxia of tissues and certainly increased morbidity.

Respiratory embarrassment.—This may result: (a) from deep burning of the face, neck, thorax and upper abdomen, where an encircling cast of dead skin can act as a mechanical vice; (b) from œdema pressure on the trachea or swelling of the mucosa lining the pharynx; (c) from irritation of bronchial mucosa from irritant hot fumes and reactionary outpouring of fluid; (d) from severe pain of movement of burnt chest wall and (e) from inhalation of vomitus, especially following swallowed poison.

Poisoning.—This may result from inhalation of carbon monoxide or from the swallowing of corrosives and other poisons. The corrosives and poisons may have both general and local effects.

In addition to sustaining life, first-aid measures should seek to alleviate suffering and prevent deterioration of the casualty's condition until he arrives in hospital. It is sometimes in the interest of speed of transport to

omit first aid or simply to appreciate that there are no effective first-aid measures.

FIRST-AID TREATMENT

The early threats to life are from:—(1) acute loss of blood and plasma (shock); (2) respiratory embarrassment or failure of respiration; (3) poisoning.

For the acute reduction in circulating blood or plasma volume, the sooner the casualty is transferred to hospital for transfusion the better. For shock the patient is kept lying with the head lower than the feet. He should be lightly covered but heat should not be applied. The object is to conserve body heat. For respiratory embarrassment, again prompt transfer is indicated though administration of oxygen during transport would be beneficial. With failure of respiration in electric shock, artificial respiration must be started immediately. Carbon monoxide poisoning can kill. The skin, finger-nails and lips may remain a bright red colour while the patient may complain of headache, dizziness, difficult breathing and nausea. Oxygen administration is necessary but, until this can be set up, artificial respiration can be started.

First-aid measures for local care of burns are unfortunately limited. There is no effective local application for the severe pain of an extensive superficial burn and there is danger of increased anoxia in the administration of accepted average doses of morphine or other hypodermic sedatives. The danger of infection is limited by covering the burn with a clean sheet.

Priorities in first-aid care are useful.

Group A.—Those which require immediate treatment to save life (as already indicated).

Group B.—Those which require the immediate transfer of the patient to hospital:

(1) All extensive burns and scalds (involving more than half the area of an upper extremity).
(2) All burns associated with other severe injuries.
(3) All which involve the face, hands and feet, except if trivial.
(4) All burns which involve the eyes.

Group C.—Those who can receive full initial first aid but who later may require supervision at home or at a surgery.

GROUP A

Respiratory embarrassment.—For resuscitation the mouth-to-mouth and Holger Nielsen methods are advised.

Mouth-to-mouth resuscitation:

(1) The casualty is laid on his back and foreign material cleared from his mouth.
(2) One hand is placed under his neck and lifted while the other hand pushes the forehead back, to hyperextend the neck.
(3) The chin is pulled upwards.
(4) The mouth is placed firmly over the patient's mouth, his nostrils are pinched shut and the chest forcibly inflated. In the small child the mouth can be placed over both mouth and nose.
(5) Remove mouth and listen for exhaled air. Repeat forcible inflation.
(6) If air exchange is not obtained, the air passage should be checked for blockage: e.g. tongue, foreign matter in throat.

(7) Continue mouth-to-mouth breathing; in the adult one breath every five seconds; in small children one every three seconds.

The Holger Nielsen method of artificial respiration:

(1) Turn the patient face down with arms bent, forehead resting on hands and neck extended. The mouth and nose passages should be unobstructed. If indicated, sharp blows should be administered between the shoulder blades to free any obstruction.

(2) Kneel at the head, one knee near the head and one foot by an elbow.

(3) Place the hands over the shoulder blades with the fingers spread and the thumbs close to the mid-line, arms straight.

(4) Rock forward and apply light pressure and count 'one, two' in seconds.

(5) Rock back and slide hands to elbow of patient and count 'three' for one second.

(6) Catch patient's upper arms and raise and pull them, counting 'four, five' in two seconds to allow in-breathing.

(7) Lay arms back in position and place hands on patient's back, as before, counting 'six' for one second.

(8) Repeat rhythmic rocking ten times a minute.

Poisoning.—Send for a doctor and indicate the nature of the poison. Meantime, if the poison is not known, give several glasses of milk or try to induce vomiting by sticking the fingers down the throat, or give several glasses of warm water containing one tablespoonful of salt to a glass. If, however, the poison is a strong acid or alkali, do not induce vomiting but dilute or neutralize: e.g. acids with two teaspoonfuls of magnesia to a glass of water and alkalis with a teaspoonful of lemon juice or vinegar to a glass of water.

Following the swallowing of poison, the first step is to safeguard respiration. The patient is placed prone to limit possible inhalation of vomitus. Artificial respiration may be necessary in the presence of œdema of the glottis and tracheostomy may be indicated. It is seldom advisable to wash out the stomach for fear of perforation. Specimens of vomitus and of any of the presumed poison must be kept.

In children, the most common and dangerous drugs are ferrous sulphate, the antihistamines and caustic soda. Following the swallowing of ferrous sulphate tablets, the child should be held upside down and vomiting promoted. Good and accessible emetics are salt (a rounded tablespoonful to a tumbler of water) and mustard (a level teaspoonful to the tumbler). In children, gastric lavage with warm water through a rubber tube (at least 18 French) using 50 ml. a time is often effective.

Swallowing of lysol or phenol.—If the casualty is seen within fifteen minutes the stomach should be washed out, preferably with a solution containing magnesium sulphate or milk. During this procedure the casualty is kept prone.

GROUP B

Cover with a clean cloth and refer immediately to hospital by private car or ambulance. A practitioner may consider the administration of intravenous morphine in painful burns of moderate extent but in the more extensive burns only a modified dose (if any) should be given (intravenously) and a

note sent to the hospital of the dose and route of administration, the time of the accident and the time of administration of the drug.

Clothing should not be removed and the burnt surface should not be exposed. Dressings should not be applied to the burn except those specified: i.e. clean, dry sheet, towel or cloth. In no circumstances should oil, grease, flour, soot, baking soda or lysol be applied to the burn. Castor oil, or any other medicine, should never be administered. If local cover is to be applied it should be done by a physician or by a first-aid worker with dry sterile material. If these are not available the casualty should be sent without any interference to an outpatient department.

The physician may, if shock is controlled, employ morphine to control pain and thereafter, if early transfer to hospital be impossible, clean the surrounding skin with 'pHisoHex' or cetrimide and the burnt surface with warm sterile physiological saline solution. The loose epidermis is removed except where it is scorched and adherent, or if it be on the palmar aspect of hands and fingers.

For local dressing the raw surface is covered with a thin layer of fine-mesh non-greasy fabric which does not adhere, followed by copious dry absorptive gauze dressing. The burnt part is then elevated.

Chemical burns of skin.—Phenol or lysol can be washed off promptly with water before they do much damage.

Severe irritants and corrosives in the eye.—For the blepharospasm cocaine drops may be useful to allow vigorous washing out with water. A more effective solution in the case of lime burns is 2 ounces (57 g.) of ammonium tartrate in one pint (570 ml.) of distilled water. This solution should be made up freshly. Following the washing out, the casualty is sent to hospital.

GROUP C

For this type the first requirement is to relieve pain. The most effective method is to hold the part under cold running water. Thereafter, a simple dry dressing should be applied. The part should be kept at rest and the dressing kept quite dry until healing takes place. Blisters should be pierced with a sterile needle, but the skin should not be cut away. If facilities for sterilizing a needle are not available, blisters should be left intact. Do not apply any ointment, oil or antiseptic.

Reference

Patey, D. H. (1958): 'An Introduction to Surgery', London.

FIRST-AID TREATMENT OF EYE INJURIES

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It is of paramount importance to the patient that the first-aid treatment of all eye injuries should be of a correct type and be given promptly. Every eye injury should be looked upon as potentially serious and examined carefully, if a satisfactory result, with return of full vision, is to be obtained. The most serious complication causing loss of vision is infection by pathogenic organisms which multiply rapidly in the eye tissues, and in order to prevent this the immediate treatment should be prophylactic and antiseptic, as well as protective. In practice it is quite common for an injured person not to be conscious of the severity of his condition as pain from deep structures is less than from superficial ones, and workers in industry do not want to lose time from work. When the possible dangers are not realized it is difficult to persuade them to return to the first-aid centre for follow up, and impairment of vision may result from neglect. It is therefore necessary to establish a proper and adequate programme for the care of all eye injuries, whilst the need for subsequent treatment must be impressed on both workers and supervisors.

In the aluminium industry there are the usual engineering hazards such as dust or metallic splinters in the eye, arc eye from welding, and conjunctival inflammation and hæmorrhage from blows to the eye. In certain processes there are special hazards involving burns to the eye from molten metal or flux, caustic soda, acids and hot pitch. The main job of first aid is therefore as follows:—

(a) To distinguish between severe and trivial injuries
(b) To eliminate the present possibility of infection
(c) To prevent further infection from outside
(d) Relief of pain

EQUIPMENT

The minimum essentials supplied to the treatment centres are as follows:—

Sterile pledgets of wool and gauze
Sterile eye-pads of gauze, 2 inches (5 cm.) diameter
Applicators: thin round wooden sticks with a wisp of sterile cotton-wool wrapped round one end
Zinc oxide adhesive plaster, half-inch (1.3 cm.) wide
Number One factory eye-drops: Cocaine 0.5 per cent., mercury perchloride in castor oil 1:3000
Number Two factory eye-drops: Butacaine sulphate 2 per cent.
Boric acid solution (saturated)
Weak eye-drops of sulphacetamide B.P.C. (10 per cent.). Eye ointment of sulphacetamide B.P. (6 per cent.)
Cetrimide (1 per cent.). Cetrimide ointment (6 per cent.)

'Bornolin' ointment (cod-liver oil, halibut-liver oil and calciferol in soft paraffin)
Olive oil
'Dehesine' (plaster remover)
Eye-baths
Eye-droppers
Binocular loupe

Special equipment.—This consists of an eye-bath and bottle (fig. 1) for continuous irrigation with:—

Ammonium chloride, 2.5 per cent. solution
Saline
Sodium bicarbonate, 6 per cent. solution

In addition, all first-aid centres have a reclining chair with spotlight, which is of great assistance in relaxation of the patient and ease of treatment.

INSTRUCTIONS TO FIRST-AID AND NURSING STAFF

The staff are taught the importance of gentle handling of all eye injuries, and to make a routine examination of the eye using Number One eye-drops to prevent pain and relieve orbital spasm. A history of how, when and where the accident happened is taken, and the probable extent or seriousness determined. The examination is carried out under a good light and using the binocular loupe.

FIG. 1.—Eye-bath and bottle for continuous irrigation. A= Eyebath; B=Tube from base of eye-bath (outflow). C= Metal screw-cap. D and E= Tube and bulb for air input pressure.

FOREIGN BODY INJURIES

The patient is placed in the reclining chair and the eye examined with the binocular loupe under a good light. The presence of a large penetrating wound of the cornea, with or without hæmorrhage, is obviously serious and no treatment involving dropping solutions into the eye should be attempted, because of the risk of penetration into the chamber. A sterile pad should be lightly applied over the eye and the patient sent to hospital with a note giving full particulars of the injury.

Dust in the eye.—When particles of dust only are observed on the surface of the conjunctiva the patient is allowed to bathe his eye with boric acid solution in an eye-bath. If this is not successful Number One eye-drops are instilled and the dust particles removed by a light twisting motion of the cotton-wool applicator, and a drop of sulphacetamide solution is finally instilled into the eye to prevent subsequent infection and to encourage quick healing of the conjunctiva.

Metallic body.—The patient usually complains of pain and photophobia with lacrimation. On examination the metal can be seen either on the surface or embedded in the cornea. If the foreign body is on the surface Number Two eye-drops are instilled and an attempt made to remove it by use of the cotton-wool applicator. If this is not successful, or the metal is buried too deeply, the nurse must not try to remove it by other means such as a metal spud. After covering the eye with a sterile pad, the patient is sent to an ophthalmologist, with a note of the circumstances including the time of the accident and the treatment given. If, on the other hand, the foreign body is removed by the applicator, a drop of the sulphacetamide solution is put into the eye and the patient is told to return next day for re-examination, there being no need for the application of an eye-pad. If, on re-examination, the conjunctiva is red and the patient complains of pain or discomfort he should be sent to hospital for examination and treatment.

In all cases in which pain is severe Number Two eye-drops can be used instead of Number One eye-drops and are more effective when applicators are used. It is emphasized to all staff that no metal instruments must be used to remove foreign bodies as that is better left to the ophthalmic surgeon. It is usually found that in the large majority of cases foreign bodies can be removed by this procedure in the first-aid centre and only about 20 per cent. require to be sent to hospital.

In a number of cases dirt and abrasions may be found on the eyelids or surrounding skin. These are adequately dealt with by rubbing gently with cotton-wool soaked with cetrimide, 1 per cent., which not only cleans the surface but renders it antiseptic as well, although care must be taken to protect the eyes against contact with the solution.

BURNS OF THE EYE

These injuries, especially when due to chemicals, must be treated promptly and adequately to prevent loss of vision. In the varied processes employed in the aluminium industry these risks are always present and, as already mentioned, comprise hot pitch, caustic soda, molten metal and flux, as well as acid. Protective measures are given considerable publicity throughout the factories and masks, goggles and visors are worn on suitable jobs, whilst in the chemical factories buckets and basins filled with water are placed at strategic points for rapid immersion of the face in the event of accidental splash. Several years ago over 150 caustic soda burns to the eyes occurred each year and partial loss of vision developed in a number of cases, but the number has now been reduced considerably and loss of vision is almost unknown. In spite of all the precautions taken in each factory, however, eye injuries still occur and the first-aid methods of treatment used are as undernoted.

Pitch burns.—These injuries are due to a splash of hot pitch entering the eye. The patient complains of pain, lacrimation and partial loss of vision.

On examination the conjunctiva is inflamed and spots of pitch are easily seen. Number Two eye-drops are instilled and the pitch can usually be removed fairly easily with the cotton-wool applicator. Afterwards sulphacetamide eye-drops are put into the eye and the patient is asked to report back for re-examination next day when the drops are continued to prevent infection developing. Usually there are pitch burns on the surrounding skin which can be removed with gentle rubbing with cotton-wool soaked in olive oil or 'dehesine', and finally with cetrimide. This is usually proceeded with after the eye has been attended to. It is seldom that the worker requires to leave his work for this injury, and it is not necessary to pad the eye after treatment. If, however, the pitch is not removed from the eye the patient must be sent to hospital with the usual note.

Molten metal and flux.—Injury from molten metal or flux, fortunately does not occur as often now as all workers in dangerous proximity to molten metal must wear goggles or visors. Occasionally, however, a small spot of metal gets into the eye over or under goggles under certain conditions. The patient has considerable pain, lacrimation and inflammatory reaction in the eye. Number Two eye-drops are immediately put in and the eye examined. Usually in addition to the metal embedded in the cornea there is an area of brown burnt tissue surrounding it. It is always advisable to put in additional drops of Number Two eye-drops to reduce the pain, and to place a sterile pad and bandage over the eye. Practically always there are accompanying burns on the face and they are usually treated with 'bornolin' ointment. This is a sterile bland oily preparation which is soothing and does not complicate matters for the surgeons at the hospital. A note giving full particulars regarding time of injury and treatment given is then sent to the hospital with the patient.

Caustic soda burns.—In our chemical works this injury is fairly common and there is no inducement needed to get injured people to use the immersion buckets and basins sited near the dangerous jobs. After immersion the patient is brought to the first-aid centre. The eye is immediately irrigated with saline solution and this is continued for fifteen minutes. One or two drops of Number Two eye-drops are then instilled into the eye and after a short rest the eye is irrigated with 2.5 per cent. ammonium chloride solution in the special irrigation bottle for a further fifteen minutes. This process is rather painful and Number Two eye-drops may have to be put in again in order to make sure that the patient opens the eye fully for irrigation. This is extremely important as the ammonium chloride neutralizes the caustic which has penetrated through the conjunctiva and so prevents a continuation of the burning process in the deeper structures. Finally a further irrigation with saline is carried out for ten minutes and a sterile pad fixed over the eye. Burns to the surrounding skin surface are treated by swabs soaked in 5 per cent. ammonium chloride and then dressed with cetrimide or 'bornolin' ointment. The patient is then sent to the ophthalmologist with full details of the injury and the treatment given.

Acid burns.—In all cases of acid burns a similar immersion treatment is carried out near the site of injury. In the first-aid centre irrigation is carried out with sodium bicarbonate solution for fifteen minutes and Number Two eye-drops dropped into the eye. Finally, saline irrigation is continued for another fifteen minutes. Another application of Number Two eye-drops and a sterile pad applied to the eye are followed by a precautionary visit of the patient to the hospital with details as in other cases.

Arc eye or welding flash.—This injury is caused by exposure of the naked eye to ultra-violet and infra-red rays emitted from the welding process. The patient suffers from acute pain, photophobia and lacrimation, and the pain usually does not occur until some hours after exposure, or it may result from repeated exposure. On examination the eye is inflamed and watery while the pain and discomfort are acute. Number Two eye-drops must be instilled as soon as possible, after which the eye must be examined for any foreign body which sometimes accompanies this form of injury. The usual method of removal by the cotton-wool applicator is then adopted. In arc eye it is common for pain to recur and it is as well to keep such patients in the centre for another half-hour in order to make sure that the pain does not return. Number Two eye-drops should again be instilled if this happens. Finally, sulphacetamide drops are put into the eyes and the patient is asked to report back the next day for re-examination. There is no necessity for a pad over the eyes in such cases, and they usually clear up satisfactorily in twenty-four hours. If on re-examination there is still evidence of inflammation of the conjunctiva it is probably due to an embedded foreign body and it is advisable to send the patient to the ophthalmologist with full details of injury and treatment given.

CONCLUSION

In each first-aid centre I try to ensure that serious injuries are recognized, and that only the minimum essential treatment is undertaken in such cases. I also consider it necessary that all such cases should be referred to hospital as soon as possible with full particulars and usually with the eye bandaged. I have found that training of nurses and first-aid personnel in the limits of permitted treatment, and the need to carry out the essentials thoroughly (e.g. in caustic and acid burns) has improved the patients' expectation of full vision to a considerable degree. It has been my experience that the less serious injuries are greatly in the majority, and the simple forms of treatment adopted have reduced suffering and in some cases prevented partial loss of vision.

FIRST-AID TREATMENT OF POISONING

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IMMEDIATE treatment will most often be required in dealing with the acute manifestations of accidental or suicidal poisoning in the home, but acute episodes can occur in the course of chronic poisoning which may have an industrial origin: for example, convulsions in lead poisoning. Emergencies may also arise in rural districts as a result of the use of a variety of substances as pesticides or herbicides, often affecting, at the same time, a number of people in varying degree. Carbon monoxide poisoning in industry or in the home may also affect a number of people simultaneously.

SWALLOWED POISONS

The commonest type of emergency arises when a known toxin, often a drug or simple domestic substance, has been swallowed. Three aspects of the situation must be dealt with: first, the removal of the poison or the prevention of its absorption; second, any measures necessary to keep the patient alive; third, the use of any known specific antidote.

Emesis should be induced at once in any conscious patient. Digital stimulation of the fauces is probably the most effective method of achieving this and can be carried out by any determined and intelligent relative or neighbour and may be assisted by a draught of a strong solution of salt in hot water. Instructions for these simple procedures can be given by telephone and vomiting may be successfully produced before the arrival of the doctor or ambulance. This does not mean that danger has been eliminated, and gastric lavage should always follow either at home or at the nearest casualty department. Patients who have died of barbiturate poisoning may be found at necropsy to have undissolved capsules of barbiturate in the œsophagus and stomach, so it is obvious that even after considerable delay gastric lavage may be of some value. The technique is quite simple, but attention to detail is necessary if the aspiration of fluid into the lungs is to be avoided, particularly in the unconscious patient.

The best position is prone with the head over the edge of a table to ensure that the mouth is at a lower level than the larynx. Any dentures should be removed and the mouth held open with a gag in the unconscious or struggling patient. The stomach tube is passed over the tongue and down the œsophagus to a distance of 20 inches (50 cm.) in an adult, at which point the stomach should have been entered. Absence of coughing or of breath sounds will confirm that the trachea has not been intubated. Tepid water is now poured into the funnel on the end of the tube, held well above the patient's head. When about a pint (570 ml.) has entered and before the funnel is completely emptied, it is lowered over a bucket and the gastric contents

are syphoned back. This process should be repeated until two gallons (9 litres) of water have been used. The washings should be retained for subsequent analysis. In infants and children a smaller tube is used and the stomach is entered 10 to 12 inches (25 to 30 cm.) from the incisors, and only half-a-pint (290 ml.) of water is used for each lavage. The struggling child or adult is most easily controlled during this unpleasant procedure by being wrapped in a blanket.

The corrosive poisons are the only contraindication to immediate emesis and gastric lavage, and their ingestion can be readily diagnosed by the condition of the mouth and fauces.

If there is any delay in gastric lavage one of the 'universal antidotes' may be used. A useful formula consists of powdered charcoal two parts, magnesium oxide one part and tannic acid one part; two teaspoonfuls of the mixture suspended in water are given immediately and some of the suspension can be left in the stomach after the washings are clear. White of egg is traditionally given in corrosive poisoning and may be of some value.

Immediate treatment may be required for severe pain and shock, coma, respiratory failure, convulsions and dehydration.

Pain and shock are most severe in corrosive poisoning and should be treated by morphine and intravenous or subcutaneous saline.

Coma and respiratory failure are most often due to the barbiturates or the narcotic analgesics and the specific treatment is considered later, but as a temporary measure manual artificial respiration may be necessary and can be combined with oxygen or 5 per cent. carbon dioxide and oxygen given through an efficient mask.

Convulsions may be central or spinal in type and are best controlled by the use of a short-acting barbiturate given intravenously. Gastric lavage will have to be delayed until this control is achieved.

Dehydration complicates the irritant poisons producing vomiting and diarrhœa and is also prominent in aspirin poisoning. Isotonic saline should be given intravenously or by intra-gastric drip until the blood pressure is normal and the urinary output adequate.

SPECIFIC SWALLOWED POISONS

Aspirin and methyl salicylate.—These patients have usually vomited as a result of gastric irritation, but gastric lavage is still essential and should be performed even after several hours' delay. Half-an-ounce (14 g.) of magnesium sulphate may be left in the stomach if the patient is not grossly dehydrated, to ensure a fluid bowel action. Children who have taken aspirin should always be admitted to hospital and this also applies to most adults. The dehydration, respiratory alkalosis, metabolic acidosis and renal dysfunction which occur are of such complexity and change so rapidly that frequent estimations of the blood electrolytes are necessary as a check on treatment, and domiciliary management is almost impossible. Apart from gastric lavage the only treatment which can be safely given at home is intravenous sodium lactate or glucose saline and the parenteral administration of a vitamin K analogue.

Barbiturates and other hypnotics.—In the conscious patient an attempt should be made to produce vomiting and in the comatose patient immediate gastric lavage must be performed. Death occurs in a few hours from respiratory failure and anoxia if a rapidly acting barbiturate has been taken (cyclobarbitone or pentobarbitone) or may result either from respiratory failure or hypostatic infection with the long-acting ones (barbitone, phenobarbitone). Bemegride, 50 mg., should be given intravenously every ten minutes if there is gross respiratory depression and it may be necessary to carry out manually assisted respiration until a positive-pressure respirator is available. The unconscious patient should always be moved to hospital at the earliest possible moment and as respiratory failure can supervene suddenly should be accompanied by someone capable of assisting respiratory movements. Once in hospital the choice of treatment will depend upon the depth of coma and the availability of any of the special forms of treatment, using a positive-pressure respirator, forced diuresis with alkalinization of the urine or dialysis. Anti-infective measures and careful nursing will always be required if the period of unconsciousness is prolonged.

Morphine and allied narcotic analgesics.—Respiratory depression is extreme and nalorphine, 5 to 10 mg., should be given intravenously. Improvement in the depth and rate of respiration occurs rapidly but may not be long maintained and the injection will usually need to be repeated. Assisted respiration may be necessary. The drug may have been swallowed and gastric lavage is essential.

Ethyl alcohol.—There is no specific remedy, but the gastro-intestinal tract usually contains unabsorbed alcohol so that emesis and gastric lavage are useful. Severe respiratory failure may be helped by nikethamide injections B.P., 2 to 5 ml., intravenously and by assisted respiration.

Methyl alcohol.—Poisoning is usually only suspected twenty-four hours after ingestion when the patient presents a picture of acidosis with vomiting, headache and the characteristic type of respiration. The immediate treatment is to give 5 per cent. sodium bicarbonate solution by mouth and sodium lactate intravenously. Subsequent treatment should be in hospital.

Ferrous sulphate.—Symptoms are often delayed for several hours and then present as an acute gastroenteritis. Gastric lavage is essential and children should always be admitted to hospital.

Atropine and belladonna.—Poisoning may occur as a result of absorption through the skin or mucous membranes, but more often follows the ingestion of the berries of the deadly nightshade or woody nightshade by children. Emesis should be followed by gastric lavage. The excitation and delirium should be treated by paraldehyde intramuscularly or, in severe cases, by intravenous thiopentone sodium. Pyrexia is usual and if extreme should be treated by tepid sponging. Retention of urine may require catheterization.

Phenol and other phenolic disinfectants.—These may be taken by mouth in error or in a suicidal attempt, but may also be absorbed through the

skin, particularly if the clothing becomes soaked by them. In the latter case the clothing should be removed and the skin thoroughly washed with plenty of soap and water. When only a small amount has been swallowed vomiting should be induced and followed by an adequate dose of magnesium sulphate to produce purgation. Larger amounts require careful gastric lavage using magnesium sulphate, 1 ounce per gallon (6 g. per litre), followed by intravenous saline or lactate saline and possibly assisted respiration. Suppression of urine may occur and the patient should be in hospital.

Oxalic acid; salts of lemon.—These are usually swallowed in a suicidal attempt, but can be taken in error for magnesium sulphate. Vomiting usually occurs spontaneously, but should be followed by gastric lavage leaving lime water, chalk or milk in the stomach in an attempt to convert any remaining oxalate into the insoluble calcium salt. Shock may require the appropriate symptomatic treatment and the patient should be transferred to hospital as renal failure may follow after a latent period of several days.

Lead.—Two emergencies may arise in the course of lead poisoning which may require urgent treatment, lead colic and lead encephalopathy, the latter most often in children. Lead colic is treated symptomatically with analgesics, lead encephalopathy by intramuscular paraldehyde or intravenous thiopentone sodium. In both cases the specific treatment with sodium calciumedetate should be started as soon as possible.

In the case of colic, 1 g. by mouth every six hours for one to two weeks is usually adequate. In encephalopathy it should be given intravenously as a 3 per cent. solution in normal saline to a total dose of 0.5 g./30 pounds (37 mg./kg.) body weight in twenty-four hours. This may need repeating for several days and should be followed by oral treatment.

Antihistamines.—Poisoning is most common in children and presents with restlessness, confusion, convulsions and coma. Gastric lavage is essential and the child should be in hospital as the phase of excitement is followed by respiratory depression. Intravenous thiopentone sodium may be given to control the convulsions so long as facilities are available for the subsequent treatment of respiratory failure.

Strychnine poisoning is characterized by spinal convulsions. Admission to hospital is essential as the convulsions have to be controlled by trichlorethylene inhalations or intravenous thiopentone sodium before gastric lavage is possible. Skilled anæsthetic care is essential and the treatment combines barbiturates with muscular relaxants such as suxamethonium, tracheal intubation and positive-pressure respiratory assistance.

AGRICULTURAL POISONS

The organo-phosphorus insecticides may be absorbed by inhalation, ingestion, or through the skin. They inhibit cholinesterase activity and the patient exhibits the symptoms of parasympathetic stimulation with nausea, colic, sweating and salivation. The pupils are contracted and pulmonary

œdema and convulsions may occur. Absorption has often been through the skin, and rubber gloves should be worn when handling the patient. The clothing should be removed and the skin washed with soap and water. Atropine, 1 to 2 mg., should be given at once and the injection repeated every half-hour. Artificial respiration may be required and a mercurial diuretic may diminish the pulmonary œdema. P.A.M. (2-pyridine aldoxine methiodide) may be given as a 5 per cent. solution intravenously to a total of 1 g. but this does not replace the use of atropine. When the insecticide has been swallowed gastric lavage should be performed with a solution of sodium bicarbonate.

Poisoning by the dinitro weedkillers (D.N.C., D.N.O.C., and D.N.B.P.) may also occur. Their effect is to increase the rate of cellular metabolism. Sweating, thirst, anxiety and euphoria are early symptoms. Tachycardia and pyrexia occur with more severe poisoning and there may be some yellow discoloration of the sclera and skin. There is no specific remedy, but it is important that symptoms should be treated as they arise. The patient should be nursed in a cool room and tepid sponging used for hyperpyrexia Fluid and salt loss are replaced by intravenous or intragastric drip and anxiety allayed with barbiturates. It is probably better to treat these patients at home and not subject them to the disturbance of a journey in a hot ambulance.

CARBON MONOXIDE

The immediate step is to remove the patient from the contaminated room and into fresh air, every minute counts and no time should be wasted opening windows or turning off taps. If breathing has ceased or is very shallow artificial respiration should be started at once; 5 per cent. carbon dioxide in oxygen administered through an efficient mask will increase the elimination of carbon monoxide. Assisted respiration should be continued for as long as necessary and the patient should be transferred to hospital for a short period of observation.

CONCLUSION

From this brief account of some of the first-aid measures which may be useful in poisoning it will be apparent that emesis followed by gastric lavage form the cornerstones of treatment when a poison has been swallowed. Many of the drugs required in treatment are to be found in any doctor's emergency bag and the only additional equipment necessary is for gastric lavage: a funnel and two tubes, one for adults and the other for infants. The additional drugs carried should include bemegride 50 mg., nalorphine 10 mg., nikethamide injection B.P. 2 ml., and atropine 1 mg.

Finally, it must be appreciated that after first-aid treatment the patient should in nearly all cases be moved to a hospital and preferably detained there for twenty-four hours under constant observation; failure to observe this precaution may result in death if delayed symptoms develop and immediate aid is not available.

THE 'SHOCKED' PATIENT

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Shock results from major injuries to the mind or body. It is an extremely complex syndrome about which much has been written and many theories have been advanced. Fortunately, from the practical point of view, it is possible to simplify the facts and to arrive at what appears to be, in the light of our present knowledge, a logical approach to the problem. Shock has two purposes: it acts as a signal that all is not well with the 'physiological balance' of the body, and it serves as a temporary defence mechanism.

DEFINITION AND DESCRIPTION

It can be defined as a circulatory failure resulting from a decrease in the volume of the 'active' circulation. The decrease in volume may be due to a pooling of large volumes of blood in the skeletal muscles and gastro-intestinal tract (neurogenic shock) or to hæmorrhage (oligæmic shock). Untreated neurogenic shock may result in early syncope and death. Untreated oligæmic shock with progressive loss of blood may give rise to diminished cardiac output, and anoxia of vital cells terminating in irreversible shock and death. It will be noted that the terms 'primary shock' and 'secondary shock' are no longer used. This is because the definition of these terms includes a time factor, and this could lead to diagnostic confusion.

Neurogenic or vasovagal shock (*previously called primary shock*).—After an injury or emotional upset, such as witnessing or taking part in an accident, reflex neural stimulation of the autonomic nervous system may give rise to such widespread vasodilatation in the voluntary muscles and gastro-intestinal tract that a large volume of blood leaves the 'active' circulation to pool in these organs. (If all muscle capillaries were dilated at once, they could contain the whole of the normal blood volume!) This type of shock usually appears promptly after the precipitating incident and occurs more readily in some persons than in others. The symptoms and signs include pallor, cold extremities, sweating, yawning, nausea, vomiting, loss of consciousness, decrease in pulse rate (less than 60), hypotension (systolic less than 50 mm. Hg) and deep sighing respirations.

Oligæmic shock (*previously called secondary shock*).—This occurs when the injury has resulted in a direct loss of blood either by external or internal hæmorrhage, or by an indirect loss of blood or plasma into crushed muscle or burnt tissue. This type of shock may merge with the neurogenic type but it usually develops more slowly unless precipitated by a catastrophic hæmorrhage. If only minor blood loss has occurred, pallor and lightheadedness may be the only manifestations. If major blood loss has occurred,

the signs and symptoms include pallor, cold extremities, sweating, dry mouth, thirst, rise in pulse rate (more than 100) with hypotension (systolic less than 100 mm. Hg).

A low blood pressure and faint pulse in the victim of an accident, however trivial the superficial injuries may seem, must arouse the suspicion that there may be an undetected internal hæmorrhage. There may be air hunger with rapid gasping respirations. The patient may show apprehensive alertness, apathy or restlessness even to the point of violent threshing, all of which are indicative of altered cerebral function due to cerebral anoxia. The sensibility to pain may be diminished and there is often diminished tone of the limb muscles. Occasionally the blood pressure is normal at first or even elevated due to great compensatory peripheral arterial constriction. Any movement of the patient or effort to stand up may precipitate the fall in blood pressure, and special care is indicated in these cases. Coma is not a manifestation of oligæmic shock, unless in the terminal stages, and its presence means that some other causative factor is at work, such as head injury or hypoglycæmia.

PREDISPOSING AND AGGRAVATING FACTORS

Shock is predisposed to, and aggravated by, fear, fatigue and pain; movement of an injured part; sudden change of the patient's posture; rough handling of the patient; excessive sweat loss as might occur in excessively hot conditions; overdose of morphine.

GENERAL PRINCIPLES OF MANAGEMENT

Treatment must be aimed at securing two objects:—

(i) The circulating blood volume must be conserved and restored.
(ii) The natural defence mechanisms of the body must be aided by sustaining or supporting the vasopressor mechanisms, and by lowering the metabolic requirement of the vital organs.

The practical measures to be adopted are:—

(a) Elimination of the neurogenic factors and prevention of their recurrence.
(b) Arrest of hæmorrhage and the restoration of the blood volume.

(1) *Reassurance.*—First, foremost, and of greatest importance is the comfort and reassurance of the shocked, conscious patient. A lay person may be able to make the patient comfortable but the doctor is the person to reassure. This may be his most important function and must be done with confidence and understanding. The patient should be placed in a recumbent position with the head low. If the patient is unconscious, a rapid appraisal of the situation is vital so that a lethal but reversible situation can be dealt with.

(2) *Examination and access.*—The patient should be disturbed as little as possible. If, following an accident, he is lying where he fell, do not risk moving him. The fact that he has not shifted his position probably means that he has been severely injured. A car crash victim must not be removed

from the vehicle until the extent of the injuries has been assessed. To do so could make the difference between life and death.

(3) *Establishment of airway.*—The presence of an adequate airway must first be established. In the unconscious, the tongue is pulled forward, a finger is passed into the pharynx to feel for and clear obstructions, and an airway inserted if necessary. If, in spite of an adequate airway, the patient does not breathe effectively, the possibility of a tension pneumothorax must be considered—a well-expanded, resonant chest with paradoxical abdominal breathing movements will confirm such a diagnosis. The condition can be rapidly relieved by piercing the thorax between two ribs with a wide-bore needle and leaving it *in situ*.

SPECIAL PRINCIPLES OF MANAGEMENT

(1) *Control of hæmorrhage.*—Internal hæmorrhage can be controlled only at operation, so that rapid transport to hospital (with transfusion of blood or blood substitutes if unavoidable delays are to occur) is essential. External venous hæmorrhage can be controlled by elevating the site of bleeding above the level of the heart. External arterial hæmorrhage can almost invariably be controlled by persistent pressure, digital in the first instance, and subsequently by means of a firm pressure dressing. Care must be taken not to impede the circulation beyond the level of the dressing. If persistent pressure does not control the hæmorrhage and a bleeding vessel can be seen, a clip may be applied to it. Traction in limb injuries may stop bleeding because of the compression of the deep vessels by stretched muscles and fascia.

A tourniquet is rarely required but, if all else fails, it may be used to stem arterial bleeding. It must be applied sufficiently tightly to occlude the arteries of the limb, and the patient clearly marked with the fact that a tourniquet has been used, together with the time of application.

(2) *Control of pain.*—Once the nature and extent of the injuries are known, every precaution to avoid precipitating or aggravating shock must be taken. Of prime importance is the control of pain by morphine, and the avoidance of moving the patient until this has been done. This must be given intravenously, not intramuscularly or subcutaneously, because the patient is vasoconstricted, and unless given intravenously the morphine may not be absorbed. In these circumstances the uninitiated may be tempted to give more morphine. The result is that when the normal circulation is eventually restored, large amounts of morphine are suddenly released into the circulation with alarming effects at a time when the patient should be improving. Small doses must be given ($\frac{1}{8}$ or $\frac{1}{6}$ grain [7·5 or 10 mg.]) because when given intravenously to a shocked patient in the presence of general vasoconstriction, a large proportion of it will reach the central nervous system. Whenever morphine is given, this must be clearly indicated by labelling the patient with the dose and route of administration for all who subsequently deal with the patient to see.

Fractured limbs and dislocated joints must be adequately splinted once the patient is morphinized and before moving him. Restlessness in the absence of pain indicates progressive oligæmia and transfusion should be started at once.

(3) *Rest.*—Shocked patients, however mildly affected, should be put to rest on a bed or stretcher with the foot end raised about 9 inches (23 cm.). In cases of neurogenic shock, this in itself will usually bring about recovery. The head is best left without pillows, but the patient with abdominal injuries will probably be more comfortable if a pillow is placed under the knees.

(4) *Oxygen.*—In cases in which there is respiratory embarrassment, oxygen should be given as soon as a clear airway has been established, but in cases of shock without respiratory embarrassment, there is no object in giving oxygen (Medical Research Council, 1957).

(5) *Prevention of heat loss.*—For comfort, the patient should be protected from cold and wet, and body heat conserved by covering or wrapping in dry blankets. It is wrong and harmful to use warm blankets, hot-water bottles or heat cradles because this leads to dilatation of surface blood vessels, further heat loss, lower blood pressure, loss of fluid (by perspiration), raised metabolic rate and increased oxygen requirements.

(6) *Avoidance of fluids by mouth.*—*Nothing* should be given by mouth, in spite of the fact that the patient may be thirsty. This is particularly important when the patient will require an anæsthetic for the treatment of his injuries and in severe shock because it will give rise to vomiting.

FAILURE OF INITIAL TREATMENT

Vasovagal shock.—This type of shock usually responds well to simple measures. If recovery is delayed, further measures to get blood from the dilated areas back into the active circulation may have to be considered. A simple measure is to bandage the limbs centripetally. If this fails, methylamphetamine hydrochloride, 15 mg. intravenously, should be used to bring about vasoconstriction of the peripheral blood vessels. The injection of atropine in large doses, by preventing bradycardia, may result in an improved circulation and recovery from vasovagal shock, but it may, on the other hand, give rise to tachycardia with consequent further lowering of the blood pressure so that it must be used with great caution. If in spite of these measures there is no quick recovery, the patient must be re-examined for the presence of a concealed hæmorrhage. If none is found, transfusion must not be considered in vasovagal shock unless hypotension has lasted for more than twenty minutes.

Oligæmic shock.—A loss of blood of up to a litre in an adult can usually be compensated for in favourable circumstances by vasoconstriction, but deterioration, as indicated by a falling blood pressure or rising pulse rate, must be arrested and the shock reversed by restoring the blood volume. Whenever possible, transfusion should be preceded by, or combined with, control of hæmorrhage. Signs of cerebral anoxia, such as air hunger or loss of

consciousness, mean a loss of 50 per cent. or more of the circulating blood volume, and transfusion is urgently required.

ESTIMATION OF BLOOD VOLUME DEFICIENCY

This cannot be accurately assessed except in specially equipped hospitals so that for practical purposes reliance must be placed on clinical signs. Of these, the most reliable are:—

Nature and extent of injuries.—In general, the larger the injury the greater the blood loss, especially in limb injuries and burns. Some estimation of blood loss can be gained from the inspection of clothes and dressings for shed blood.

Pulse rate.—A pulse rate above 100 almost certainly indicates a significant loss of circulating blood volume, but a slow pulse can give an erroneously favourable impression.

Blood pressure.—Probably the most useful indication of decreased blood volume is the blood pressure. A systolic blood pressure of less than 100 mm. Hg indicates a blood volume of less than 70 per cent. of normal. Similarly, a diastolic pressure below 60 mm. Hg is likely to be associated with an important reduction in blood volume.

Hand pallor.—The hands appear to show the earliest and most reliable response to blood volume depletion of any part of the body (Tibbs, 1956), the degree of pallor being closely related to the reduction in blood volume.

Of no value in assessing blood volume deficiencies are the pulse volume, the state of veins, the warmth of skin, the speed of capillary filling, the degree of sweating and the respiratory rate.

INDICATIONS FOR TRANSFUSION BEFORE REMOVAL TO HOSPITAL

Whether or not a transfusion should be set up before the patient is moved depends in most cases on the time it will take to transport him to hospital. Unless the degree of shock is critical, there is no point in wasting time putting up a drip if the hospital is only half-an-hour away. It is a good idea, however, to telephone the hospital and warn them that a transfusion will be required so that preparations can be started and the transfusion initiated as soon after the patient's arrival as possible.

In accidents in remote places (such as climbing accidents), or where casualties are trapped (as in coal-mine disasters, railway accidents), *in situ* transfusion as early as possible is most important since it may take many hours before the patient can reach hospital. The transfusion may be continued in the ambulance until the patient gets to hospital.

REPLACEMENT THERAPY

Fluid to be used.—The essential need is invariably the restoration of a depleted blood volume rather than an increase in the oxygen-carrying

properties of the circulation. Death from lack of oxygen-carrying power of the blood is extremely uncommon. It would seem at first sight that to replace the blood lost by blood would be the ideal answer, but this is not necessarily so for there is evidence to show that an embarrassed circulation responds better if its volume is made up with a less viscous fluid than whole blood. In any case, blood is rarely readily obtainable at the site of a disaster because of grouping and transport difficulties.

Blood plasma, however, is very useful as a blood volume replacement agent. No grouping is required and it can usually be obtained from a nearby hospital, the limiting factor depending upon speed of transport. In circumstances where such facilities are not available, such as remote mountainous areas, dried plasma should be carried by a rescue team. Dried plasma has the advantage that it will keep well in any climate for prolonged periods and can be reconstituted when required with 5 per cent. glucose in distilled water. One danger of using plasma is that it may contain the agent of infective hepatitis so that there is a case for using a 'plasma expander' as a suitable alternative. These are colloid preparations of large molecular weight, such as dextran, 6 per cent. in 0.9 per cent. sodium chloride. Dextran can be used to supplement or even replace blood derivatives if the supply is inadequate. It is particularly useful for beginning the resuscitation of the severely shocked patient until such time as properly grouped and cross-matched blood can be obtained. It has some disadvantages, as it causes aggregation of red blood cells. If blood transfusion may be required later, blood samples for laboratory use in blood matching should if possible be taken off before the infusion of dextran is started. Samples of blood obtained subsequently can be cross-matched only with great difficulty. Not more than 3 litres of plasma expander should be used because it will cause hæmodilution and interference with blood clotting.

It is of little use to give saline or glucose saline solutions in the treatment of oligæmia except as a very short-term expedient while awaiting the arrival of some more suitable blood volume expander, because they do not stay in the blood stream for any length of time.

Rate of transfusion.—Transfusion must be rapid at first, one bottle (540 ml.) of citrated blood or blood plasma or plasma expander being given in five to fifteen minutes. This means that the fluid is given as fast as it will enter the vein from a height of 100 cm. when the vein is not in spasm. If the vein is in spasm, local warmth in the nature of a hot-water bottle will usually lead to relaxation of the vein. Other measures that can be used in order to get fluid into severely shocked patients quickly are:—

(1) The simultaneous use of two transfusions.

(2) The use of a pump to force the fluid in.

(3) The use of intra-arterial transfusion. This requires special equipment to meter the pressure of the transfusion which should be given at a pressure of approximately 120 mm. Hg.

Transfusion is continued until:—

(1) The pulse rate falls below 100 per minute.

(2) The blood pressure is restored to a systolic pressure of at least 110 and a diastolic of at least 75 mm. Hg.

(3) The hands have been restored to a good colour.

If after three bottles of blood, these three criteria have not been satisfied, the situation should be reassessed.

(1) Is concealed bleeding still continuing? If it is, then prompt operation and further generous blood transfusion are indicated.

(2) Is there some other factor aggravating the patient's illness? Is there, for instance, a ruptured intra-abdominal viscus? The opportunity to save the patient may be lost if a careful reassessment is not undertaken and the plan of treatment modified accordingly.

(3) Is the patient in 'irreversible shock'? This is a diagnosis which must never be considered while the patient is still alive. If bleeding is controlled but the patient remains shocked in spite of resuscitative measures, more vigorous transfusion is probably required.

CONCLUSIONS

Patients can die from shock, but it is a reversible condition and as such must receive immediate attention.

Relatively simple measures can arrest its progress and usually bring about a return to normal.

Occasionally intravenous fluids are required to restore the diminished blood volume within a reasonable time.

Gone are the days when shock was treated by hot drinks and body heating.

References

Medical Research Council (1957): Memorandum on 'The Treatment of Wound Shock', H.M. Stationery Office, London.

Tibbs, D. J. (1956): *Lancet*, **ii**, 266.

THE MANAGEMENT OF THE UNCONSCIOUS PATIENT

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LAYMEN, nurses, practitioners and medical officers in hospital may at any time be presented with an unconscious patient in circumstances which may vary from the very obvious to the most obscure. In any case they are usually faced with a problem to be solved like a jigsaw puzzle with one or more pieces missing. In many instances rapid assessment of the situation and prompt action, which may be life-saving, must be undertaken before adequate examination and accurate diagnosis can be made. In other words, the basic principles of first aid must be applied before expert knowledge and professional skill can be used to their full advantage.

THE FIRST-AID APPROACH

(1) Remove the patient from danger; otherwise do not move him until appropriate help is available and he can be transported on some type of stretcher, improvised if necessary. Cover with a blanket or other protective without applying additional heat.

Special circumstances include: (a) removal from carbon monoxide and other dangerous gases such as may arise from defective geysers, coal and gas stoves and the exhausts of motor vehicles. Carbon dioxide may cause unconsciousness in workers in brewery vats, sewers and wells and in the smoke of building fires. Rescue in such cases may be difficult and sometimes impossible without adequate assistance and oxygen breathing apparatus. In entering a smoke-filled room the mouth and nose should be covered with a wet handkerchief. The breath should be held after a few deep breaths and the victim should be reached by crawling across the floor. Windows should be opened or broken if necessary.

(b) Removal from electrical contacts is dangerous to the rescuer who must take special care if he is not to become a second casualty. If the current cannot be switched off and if thick rubber gloves are not available, the rescuer must stand on some dry insulating material such as a board, folded mackintosh or thick coat. Attempts should then be made to break the contact by moving the victim with a stick, board or dry rope (N.B. An umbrella is dangerous). Thick dry gloves or the sleeves of a jacket wrapped round the hands offer some protection.

(2) Ensure plenty of fresh air and maintain an adequate airway.

(a) Unless artificial respiration is necessary, place the patient in a position in which natural respiration appears easy, turning the head to one side so that the tongue does not fall back and impede breathing. This is often the lateral or semi-prone position which can be maintained by flexing the

uppermost leg at the hip and knee. In cases of apparent drowning, after clearing the mouth of any debris the patient should be placed prone with the head directed down a slope if possible. As a preliminary manœuvre the body should be clasped round the waist and raised to empty water from the lungs before artificial respiration is initiated.

(b) Remove false teeth and loosen clothing around the neck, chest and waist, remembering that some women wear very tight foundation garments.

(c) Perform artificial respiration when required. This subject is fully dealt with elsewhere in the symposium (Carson, 1961).

(3) Take any life-saving action if the cause is evident: e.g. administer oxygen, perform gastric lavage, give an antidote to any known poison, perform tracheotomy, give glucose for hypoglycæmia.

(4) Give nothing by mouth until some degree of consciousness has returned and it is obviously safe to do so.

(5) Do not let the patient sit up immediately after apparent recovery of consciousness.

(6) Most cases will require removal to hospital as soon as this can be safely done.

THE DIAGNOSTIC APPROACH

Assuming the patient is free from immediate danger further steps may then be taken.

(1) *Identification of the victim.*—In some circumstances there may be medico-legal consequences and it is important to note the time of arrival on the scene. If there is no other information a quick glance at the patient's diary and wallet may be necessary: (a) for evidence of identification and address for the purpose of contacting relatives who may be able to give vital information; (b) for evidence of any medical card indicating, for example, diabetes mellitus, epilepsy, hospital attendances. If the police are involved, this action may well be left to them; they are always most helpful in matters of this sort and in establishing communications.

(2) *Observation of circumstances.*—In any case of unconsciousness it is most important to establish the presence or absence of head injury which may be indicated by external wound, depressed fracture, or bleeding from the nose, mouth or ears. Cyanosis or stertorous breathing should also be noted. In any case of suspected poisoning, tablets, bottles and any vomitus must be carefully preserved. The smell of acetone or alcohol may be detected in the breath, although the latter does not necessarily indicate intoxication as it may have been administered by an ill-advised but well-meaning onlooker.

Although coma due to alcohol alone is rarely deep the commonly recurring problem of the intoxicated person who has also suffered a head injury must always be kept in mind. It is by no means unknown for a 'drunk' to be found seriously ill in a police cell even after careful medical examination.

An obviously intoxicated man was allowed to leave hospital after examination, he fell in the street, was brought back and again allowed to go after further observation had shown no obvious change. He was found dead in his cell next morning having sustained a rupture of the middle meningeal artery.

(3) *Relevant information.*—As much information as possible should be obtained from onlookers or relatives if they are available. The most important points to ascertain are: (a) any known injury, previous disease or similar episode; (b) the mode of onset of the coma, whether sudden or gradual; (c) whether any convulsions were observed. This information may help to place cases into one of two groups: (a) those in which coma precedes the general signs and symptoms of the disease from which they are suffering, or (b) conditions in which coma is a terminal state of some acute or chronic illness, the nature of which is already known or may be indicated by obvious signs or symptoms.

(4) *Physical examination.*—Injuries having been excluded, a full physical examination must be completed as soon as possible. Particular attention should be paid to:—

The pulse, respiration and colour.
Tendon reflexes, corneal reflexes and pupils (size, equality and reaction), neck stiffness and Kernig's sign.
Examination of the ears and optic discs, and estimation of blood pressure.
Specimen of urine, obtained by catheterization if necessary.
Lumbar puncture must be considered except in those cases in which evidence of raised intracranial pressure would render this procedure hazardous and in those in which it is obviously unnecessary.

(5) *The depth of unconsciousness.*—This may be assessed in three stages:—

(a) A state of confusion: i.e. inability to answer questions coherently and unawareness of surroundings such as may be found in alcohol intoxication, drug overdosage and mild concussion. Such patients are often resentful of any interference.
(b) Stupor or semi-coma where there is evident loss of consciousness but some response to painful stimuli and often apparent ability to swallow.
(c) Coma with diminished or lost reflex activity and loss of sphincter control.

(6) *The causes of unconsciousness.*—The next step is to arrive at a provisional diagnosis. Broadly speaking, cases fall into two main groups: (a) surgical, e.g. head and other major injuries, (b) medical.

For quick thinking the old mnemonic classification remains useful (A, E, I, O, U and D):—

A: Alcohol, apoplexy, asphyxia, anæsthesia, angina.
E: Epilepsy, eclampsia, encephalitis, encephalopathy, electricity.
I: Injury, insulin, infections, imitation (hysteria).
O: Opium and other poisons.
U: Uræmia.
D: Diabetes, drowning.

DIFFERENTIAL DIAGNOSIS

Apoplexy.—When unconsciousness occurs in cerebral vascular accidents it is usually abrupt in cases of cerebral hæmorrhage and embolism, but may be more gradual in cerebral thrombosis. When it develops in a case of cerebral tumour it usually does so gradually unless local hæmorrhage has occurred. In intracranial lesions of this type some unilateral physical signs are generally present. Subarachnoid hæmorrhage usually, but not invariably, occurs in an earlier age-group than cerebral hæmorrhage, and although signs of damage to brain tissue may occur these are not as common as in

the other types of apoplexy and deep coma is unusual in the early stages. The diagnosis is supported by neck stiffness, a positive Kernig's sign and the presence of raised pressure, fresh blood and, later, xanthochromia in the cerebrospinal fluid.

Encephalopathy.—This may occur in the hypertensive attacks associated with nephritis, malignant hypertension and eclampsia. In such cases well-marked albuminuria is to be expected. The tongue is usually dry and other evidence of dehydration may be present. Similar attacks may occur in dementia paralytica which can only be confirmed by the appropriate tests on the blood and cerebrospinal fluid.

Head injury.—It is of great importance not to overlook the possibility of a ruptured middle meningeal artery. Progressively deepening coma, especially if combined with signs of a unilateral focal lesion and evidence of a lucid interval, is indicative of traumatic intracranial hæmorrhage. This is often associated with dilatation of the pupil on the side of the hæmorrhage but *contre-coup* injury may cause bleeding on the opposite side to the obvious injury. Coma from subdural hæmatoma is a late complication often developing several weeks after the initial injury.

Hysteria.—In the imitative coma of hysteria there is usually reaction to painful stimuli with a brisk over-reaction to the corneal and other reflexes. Signs of organic disease are absent and any apparent limb rigidity is increased by passive movement.

Diabetic coma.—This may first be suspected from the smell of acetone in the breath. Confirmation is obtained by the presence of large amounts of sugar and acetone in the urine and subsequently by estimation of the blood sugar. It must be remembered, however, that some glycosuria without ketosis may be present in some cerebral lesions and in meningitis.

Hypoglycæmia.—When due to insulin, marks of needle punctures may be evident. The urine is free from sugar and acetone unless the bladder is full and has remained unemptied since before the insulin injection, in which case the amount present will be less than expected in diabetic coma. Confirmation may be obtained by blood-sugar estimation but if the condition is suspected glucose must be given at once.

THE THERAPEUTIC APPROACH

After preliminary first aid, emergency treatment and provisional diagnosis, steps must be taken to arrive at an exact diagnosis so that specific therapy can be started. Special arrangements must also be made for those patients in whom the state of unconsciousness is likely to persist for some time.

The patient is placed in the correct position in bed to assist in preserving a clear airway: that is, in the lateral or semi-prone position. The mattress should be of the sorbo rubber type unless a 'ripple bed' is used. If neither is available an interior sprung mattress may be used but care must be taken to protect this from incontinence by mackintosh sheeting. The bedclothes should be light but sufficiently warm. If the patient is cyanosed oxygen may

be required. An electric sucker to remove secretions from the nasopharynx may be required to maintain a clear airway and to help in preventing pulmonary complications. Emergency instruments, e.g. mouth gag, tongue depressor, tongue forceps, sponge-holding forceps, together with a supply of swabs are kept on the patient's locker.

A daily blanket bath is given and the pressure areas are treated two-hourly. At the same time the bed should be carefully made and the patient's position changed in order to minimize the risk of pressure sores. Unless injuries are present, the patient should be moved about quite vigorously, in order to displace pulmonary secretions and to encourage respiratory movements.

The fluid intake and, if possible, the urinary output are recorded daily and a four-hourly temperature, pulse and respiration chart is kept. The blood pressure and pulse rate may be recorded more frequently if this is considered necessary.

In all unconscious patients the bladder must be carefully watched for urinary retention with or without overflow. In some cases it may be necessary to insert a self-retaining catheter and at the same time to administer a urinary antiseptic, such as sulphamethizole or nitrofurantoin, to minimize the risk of infection. The bowels must be watched and fæcal incontinence may be reduced by the administration of regular enemas or suppositories: e.g. glycerin or bisacodyl.

Until the patient can swallow, nourishment must be given by tube feeding which may be carried out at four- or six-hourly intervals. This is usually made up of milk, eggs, glucose together with vitamins and added nutriments such as 'casilan' or 'complan'. Three to four pints (1.7 to 2.25 litres) are given daily. If dehydration is marked intravenous saline or electrolyte solutions may be necessary. The details will be guided by blood electrolyte investigations. Alternatively, subcutaneous saline with hyaluronidase may be employed if the patient is restless and will not tolerate an intravenous drip. It may be necessary to maintain artificial respiration by mechanical means using tracheal intubation for shorter periods and tracheostomy when deep coma prevails. In such instances an electric suction apparatus will be needed.

As a rule, an antibiotic is desirable to lessen the risk of pulmonary complications: daily or twice-daily injections of procaine penicillin may be adequate. Alternatively, an oral antibiotic may be used if the patient is on an intragastric drip or an injectable one if intravenous therapy is being employed.

CONCLUSION

The management of an unconscious patient, depending upon circumstances, may vary from masterly inactivity to complicated technical procedures which may demand long periods of careful and skilled attention. Few will have the opportunity of practising the simple method employed by Prince Charming to awaken Sleeping Beauty.

Reference

Carson, M. B. (1961): *The Practitioner*, **187**, 46.

ARTIFICIAL RESPIRATION

By MICHAEL B. CARSON, M.B., B.S.
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NORMAL respiration begins with the baby's first breath at birth and continues throughout life until it ceases at death. The association of respiratory movements with life and the decreased movements during sleep were probably the earliest medical observations made by primitive man. The fact that a sleeping man could be wakened by external stimuli, such as noise, shaking, or pain, led to attempts to arouse the dead by the application of similar stimuli.

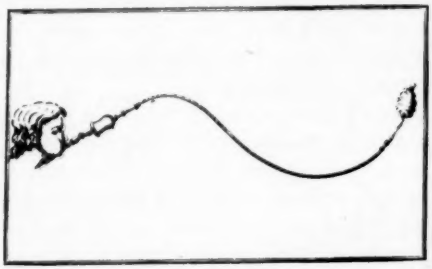

FIG. 1.—Tobacco clyster used for the resuscitation of apparently drowned persons. (From 'A Physical Dissertation on Drowning', 1746, London, anonymous but attributed to Rowland Jackson.)*By courtesy of the Wellcome Historical Medical Museum.*

HISTORY

Superstitious beliefs, followed by the growth of magic and of pagan religions, led to the association of rites with the various attempts to waken the dead. As drowning must have been a frequent cause of death it would be noticed that when the body was lifted from the water, water often poured from the mouth. The logical conclusion would be that anyone who had been drowned should be inverted and doubtless many victims recovered following this manœuvre. The vogue for the application of painful stimuli, which were no doubt sometimes successful, led to the use of increasingly painful methods including the placing of live coals on the victim's abdomen.

FIG. 2.—Photograph of an exhibit in the Museum of Science and Industry, Chicago, illustrating method of resuscitation by blowing smoke into an animal bladder and then transferring it to the patient's rectum.

In The Bible we read: 'and the Lord God formed man of the dust of the ground and breathed into his nostrils the breath of life' (Genesis, ii, 7). The author of this passage had probably heard of attempts to revive the dead by direct insufflation. Later is recorded the story of Elisha's reviving the dead child of the Shunammite woman by stretching himself upon the child and placing his mouth upon the mouth of the child (II Kings, iv, 34). Vesalius recommended direct insufflation

but this method does not appear to have caught on, probably due to æsthetic objections and the awe with which the dead were regarded.

It is not possible in a short review to list all the methods which have been tried but mention may be made of the insufflation of smoke per rectum (fig. 1, 2), rolling the victim over a barrel (fig. 3), and holding him face downwards across the back of an ox or a galloping horse.

From time to time inflation of the lungs, either by bellows or breathing directly into the patient's mouth, has been recorded. Tossach (1744) described how he revived a coal miner by mouth-to-mouth artificial respiration. It is interesting that

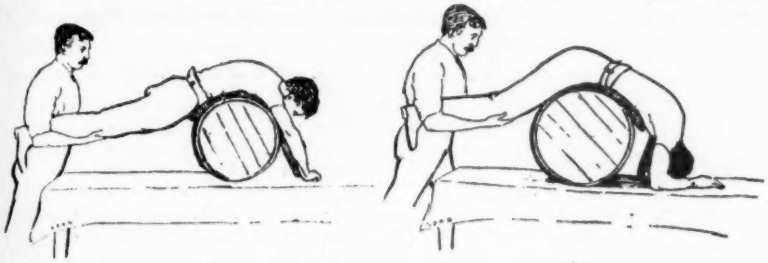

FIG. 3.—Drawings to illustrate the ancient, 'barrel', method of artificial respiration, which had been particularly used by sailors. (*a*) Commencement of inspiratory phase. (*b*) Expiratory phase. (From 'The Mechanism Underlying the Various Methods of Artificial Respiration', by Sir Arthur Keith (1909).)

the Amsterdam Society for Recovery of Drowned Persons which was formed in 1767 forbade the use of this method and this embargo probably delayed further research into this procedure (Karpovich, 1953a). In 1781, Fothergill recommended the use of oxygen for resuscitation and for some years it remained popular but fell into disrepute about 1790. Fothergill was one of the first to point out that in the supine position the tongue falls backwards blocking the pharynx (Fothergill, 1795).

From earliest times attempts had probably been made to reproduce the normal respiratory movements by manual means. In France, Leroy-d'Etiolles (1829) advocated pressure on the chest and abdomen to produce expiration. In 1840, Dalziel of Drumlanrig built an airtight box on the lines of the modern iron lung. The patient was placed inside with his head outside and a hand-operated pump produced intermittent positive pressure to cause expiration (Lewins, 1840). In 1856, Marshall Hall described his method in which the patient was rolled from side to side and while in the prone position pressure was applied to the back. Two years later, Silvester (1858) described his double-acting method in which the arms were alternately extended above the head and then pressed into the sides of the chest, the patient being supine. In 1908, Schafer introduced his method of pressure on the back (Schafer, 1904a,b; 1909). Silvester's and Schafer's methods have remained in vogue up to the present time. In 1932, Holger Nielsen, in Denmark, described his back-pressure arm-lift method and this has for some years been the one most widely taught. About the same time Eve introduced his rocking stretcher but the big drawback to this method is that it requires the use of rather complicated equipment which may not always be immediately available.

PHYSIOLOGY

In spite of the interest in artificial respiration over the centuries there appears to have been no attempt to evaluate the various practices on a physiological basis until Marshall Hall published his researches into ventilatory exchange in cadavers in 1856. From that time numerous workers have published their findings in experiments performed on dogs, corpses

and apnœic or anæsthetized subjects. As experimental techniques improved so the various procedures waxed and waned in popularity and controversy raged over the most minute variations in the position of the patient and the operator.

Any investigation into the effectiveness of different methods of artificial respiration must take into account the fact that, under field conditions, an endotracheal or similar airway is not likely to be available and therefore the ventilation achieved with the natural airway is the important figure. Not

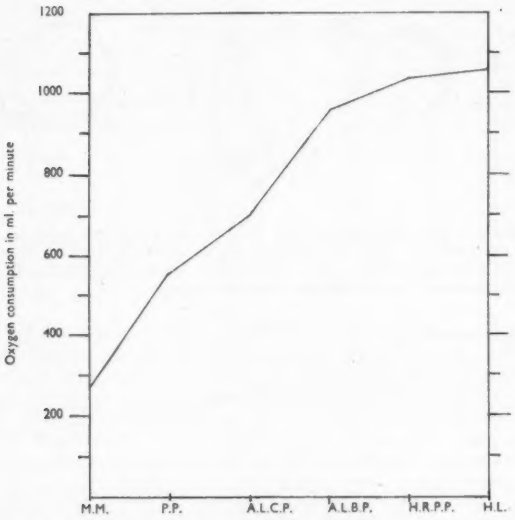

FIG. 4.—Graph showing oxygen consumption of male operators executing various types of artificial respiration. M.M.=mouth-to-mouth; P.P.=prone pressure; A.L.C.P.=arm-lift chest-pressure; A.L.B.P.=arm-lift back-pressure; H.R.P.P.=hip-roll prone-pressure; H.L.=hip-lift. (Adapted from Karpovich and Hale, 1951.)

all investigators have been careful to check this, with the result that sometimes misleading recommendations have been made. The most satisfactory results recorded are those of Safar and his colleagues (1958), who have compared the tidal volumes obtained with and without an endotracheal tube using the Holger Nielsen and Silvester methods in five anæsthetized and curarized subjects, as well as the results obtained in 13 subjects using the Holger Nielsen, Silvester and mouth-to-mouth methods with and without oropharyngeal airways and with the head extended and flexed. From these results it is clear that while using an oropharyngeal airway it is usually possible to obtain a pulmonary ventilation of 500 to 600 millilitres provided the head is extended. Without an artificial airway, however, the results with the manual methods are much more variable and often the

ventilation does not exceed the volume of the dead space. With mouth-to-mouth inflation, on the other hand, the value was always of the order of 1,500 millilitres.

When considering any method of artificial respiration it is as well to bear in mind the energy demands made on the operator, as a tiring one such as hip-rolling prone pressure cannot be performed for long. Figure 4, adapted from Karpovich and Hale (1951), shows the oxygen consumption of the operator when using different methods.

Before going further into the physiological aspect it will be helpful to summarize a few average figures:—

Tidal volume in an adult at rest: 500 millilitres.
Adult dead space: 160 to 180 millilitres.
Oxygen in inspired air: 21 per cent.
Alveolar carbon dioxide: 5.6 per cent.
Expired air carbon dioxide: 4 per cent.

Ignoring slight changes in the respiratory quotient 1 volume of oxygen absorbed produces 1 volume of carbon dioxide.

If the normal rate of respiration is 10 per minute, the minute volume will be 5 litres and the oxygen requirement $\frac{5000 \times 5.6}{100} = 280$ millitres.

If the minute volume is doubled the oxygen requirement remains approximately the same so that the expired air will contain $\frac{10{,}000 \times 21}{100} - 280 = 1{,}820$ millilitres, or 18.2 per cent. of oxygen.

If an apnœic subject is ventilated at 10 litres a minute with air containing 18.2 per cent. oxygen and his requirements are 280 ml. of oxygen a minute his expired air will contain 15.4 per cent. of oxygen, which is normal.

It might be thought that as expired air contains 4 per cent. carbon dioxide the victim's alveolar carbon dioxide would rise. If the rescuer doubles his minute volume, however, the level of carbon dioxide in his expired air will fall to 2 per cent., or 200 millilitres a minute. Assuming the victim evolves 280 millilitres of carbon dioxide a minute he will have to get rid of 480 millilitres a minute, giving a concentration in his expired air of $\frac{480 \times 100}{10{,}000} = 4.8$ per cent., which is normal. This means that if a rescuer doubled his minute volume (hyperventilated) he could breathe his expired air into a victim of asphyxia and maintain a normal blood oxygen saturation and alveolar carbon dioxide tension in the latter. Elam and his colleagues (1958), in a series of beautifully contrived experiments, have shown that these theoretical considerations hold true in practice (table I).

Djourno and his colleagues (1958), following experiments on fresh cadavers to determine the variations in cardiac output with different methods of manual artificial respiration, recommended Silvester's method in all except cases of drowning. They found that the results were improved if during the expiratory phase a series of sharp blows was administered over the lower end of the sternum. This finding is of interest in view of

the recently described method of external cardiac massage (Molloy, 1961).

The question of the relative merits of carbogen or oxygen in the treatment of asphyxia is not one it is proposed to discuss here, except to say that my own preference is for pure oxygen if this can be administered under slight pressure to inflate the lungs.

In the past we have always been taught that victims of drowning should be turned face down and tilted to drain the lungs. Recent studies of drowning in animals have shown that, in the case of fresh water drowning, water

	Before resuscitation			During resuscitation		
	No. of subjects	Mean	Range	No. of subjects	Mean	Range
Alveolar oxygen (per cent.)	6	12.3	9–15	6	16.1	15–17
Changes in alveolar oxygen (per cent.)	—	—	—	6	3.8	1–7
Arterial blood, oxygen saturation (per cent.)	14	92.4	84–96	25	93.7	87–100
Alveolar gas, carbon dioxide (per cent.)	12	5.6*	4.3–6.9	12	3.9	2.7–5.1
Changes in alveolar carbon dioxide (per cent.)	—	—	—	16	−1.0	−0.2–2.3
Arterial blood, carbon dioxide tension (mm. Hg)	14	31.6†	26–35	17	26.6	18–37
Arterial blood (pH)	14	7.48	7.45–7.53	14	7.54	7.43–7.65

*Recorded with Liston-Becker analyser after anæsthesia had been induced.
†Arterial samples obtained before anæsthesia.

TABLE I.—Patient's arterial blood and alveolar gas values before and during expired air resuscitation (Elam *et al.*, 1958).

is rapidly absorbed into the blood stream resulting in hæmolysis of the red cells with release of potassium and cardiac arrest. Salt water being hypertonic attracts fluid from the blood into the lungs, increasing pulmonary congestion. As it has also been shown that not all the alveoli will be full of water, no time should be wasted trying to drain the lungs, artificial respiration should be started at once and no other considerations, except the arrest of massive hæmorrhage, must be allowed to interfere with it (Donald, 1955; Karpovich, 1953b).

PRACTICAL CONSIDERATIONS

Mechanical respirators and rocking stretchers will not be considered here as they are unlikely to be available in the vast majority of cases.

Well over a hundred methods of artificial respiration have been recorded (Karpovich, 1953c) and each has had its advocates. When success follows efforts at resuscitation it is always difficult to be certain that the patient would not have recovered simply by being removed from the cause of the asphyxia and doubtless many people do recover with no other treatment. It is equally certain that a number of lives are lost each year by asphyxiated patients being taken on a ten-minute ambulance ride to hospital and receiving no artificial respiration during this time. There is ample evidence that when respiration stops, cardiac arrest rapidly supervenes. Unless a

cerebral circulation with oxygenated blood can be restarted within minutes irreparable damage results to the cells of the brain. The majority of the methods of artificial respiration which have been recorded are either quite impractical, are too tiring for the operator or are only slight variations of one of the well-tried methods, Silvester, Schafer or Holger Nielsen.

In selecting a method of artificial respiration the following points should be borne in mind:—

(a) It must produce satisfactory pulmonary ventilation.
(b) It must not be too tiring for the operator.
(c) It must be easy to teach and to remember.
(d) It should help in maintaining the circulation.
(e) It should be able to be performed in any situation.
(f) It should not cause injury to the patient.
(g) It must not require the use of any equipment.

Whilst under ideal conditions adequate pulmonary ventilation can be maintained with either the Silvester or the Holger Nielsen system, under field conditions without an artificial airway the ventilation is much less efficient. The only method which gives consistently good ventilation under these conditions is the mouth-to-mouth one. From figure 4 it will be seen that the oxygen requirement, and therefore the energy output of the operator, are least with the mouth-to-mouth method. Elam has performed this method on an anæsthetized volunteer for four hours without fatigue (personal communication).

MOUTH-TO-MOUTH METHOD

When teaching the standard manual methods of artificial respiration I have always found that the details are forgotten in a few weeks unless repeated instruction is given at intervals of one or at the most two months. Since 1959 I have taught mouth-to-mouth artificial respiration and have found, contrary to popular opinion, that this is very easy to do. In practice there is no need for the class to pair off, breathing into each others mouths. All that is necessary is for them to be shown how to extend the victim's head, clear the mouth, if possible, of any obstruction and pinch the nose to prevent air leakage. It is now generally agreed that there is no need to lift the jaw forward provided the head is fully extended.

Recently, an acquaintance of mine who was completely untrained in first aid and artificial respiration found his eleven-months-old daughter lying face down in a pond in his garden. The child was not breathing, was pulseless and white and he was convinced she was dead. Suddenly he remembered hearing the term mouth-to-mouth artificial respiration. He applied his mouth to the child's and found that his mouth covered her nose as well. He was holding her with her neck flexed but even so managed to breathe into her and inflate her lungs. When he saw her chest rise he stopped and then found that his mouth filled with water so he applied alternate inflation and suction and managed to extract quite a lot of water in this way. Within a matter of minutes the child began to breathe and she made an uninterrupted recovery with no sequelæ.

This account illustrates the simplicity of the method and the ease with which it can be taught. Following this experience the father learnt the method in greater detail.

By chance, two months later he was on the beach with his family when a middle-

aged man was brought out of the water apparently drowned. Nobody seemed to know what to do so he went up, extended the victim's head, pinched his nose (he did not lift the jaw forward) and breathed steadily into his mouth. This was followed by a forceful exhalation by the patient which expelled a lot of water and weed. He continued with mouth-to-mouth artificial respiration but finding he became slightly dizzy reduced the rate and the dizziness passed off. He continued for about half-an-hour when a doctor arrived and certified death. Subsequently the patient was found to have succumbed to a coronary thrombosis and not to drowning.

The rescuer's comments are interesting. He did not stop to consider the æsthetic aspects and felt no revulsion. He found the method easy to perform and was left in no doubt about its efficacy by seeing the chest rise.

The supine position means that the patient is in the best position for cardiac massage by sternal pressure.

The mouth - to - mouth method is the only one that can be performed in awkward situations: e.g. while the victim is still in the water. The only likelihood of injury to the patient is damage to the lungs from over-forceful inflation. Provided inflation is stopped when the chest is seen to rise, and that in the case of a baby only puffs from the cheeks are used, no harm will result. In the past, the chest pressure methods have all occasionally resulted in fractures of the ribs (Webster, 1957).

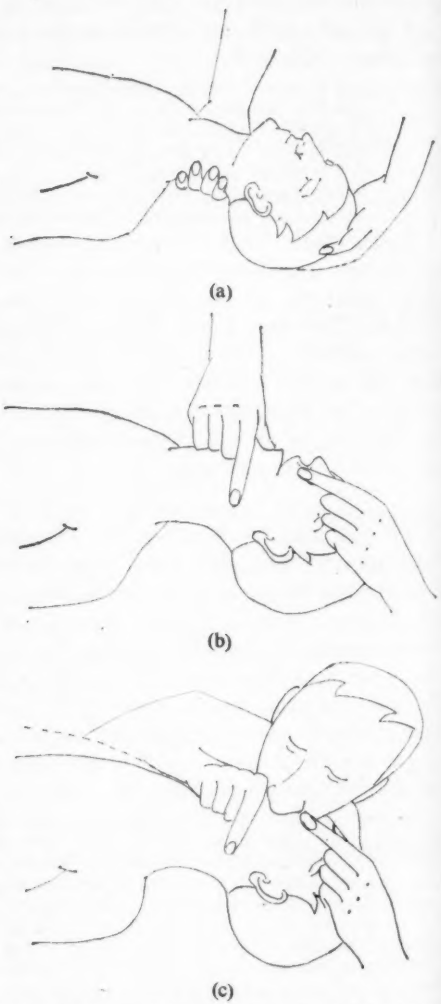

FIG. 5.—The mouth-to-mouth method of artificial respiration.

I am firmly convinced that the best method to use and the only one likely to be successful is the mouth-to-mouth one. The only possible objection is the æsthetic one but this is no real argument against a most potent

life-saving procedure. No apparatus is necessary but to overcome the æsthetic objections small pocket airways have been devised: one end fits into the patient's mouth and the rescuer breathes into the other. While these work very well the chances of one being to hand in an emergency are small. Further, it is not easy for a layman to introduce one into an unconscious person, especially if there is trismus as some authorities would have us believe. First-aid workers finding themselves unable to introduce an airway or bereft of one in an emergency may be nonplussed. I therefore prefer to teach straightforward mouth-to-mouth breathing. I doubt very much if, faced with an emergency where a life was at stake, the average person would worry very much about æsthetics.

The rules are simple:—

Place the victim on his back.

Kneel at his side and extend his head as far as possible (fig. 5a).

In an adult pinch his nose (fig. 5b).

Take a deep breath, apply your mouth to his mouth (fig. 5c) and breathe steadily into him until you see his chest rise.

Remove your mouth and let the patient exhale.

If the chest does not rise, attempt to clear the airway and make sure that the head is fully extended.

If air enters the stomach the abdomen will be seen to bulge. The air can be expelled by gentle pressure over the epigastrium.

References

Djourno, A., François, R. Ch., and Kayser, D. (1958): *J. Physiol. (Paris)*, **50**, 19.

Donald, K. W. (1955): *Brit. med. J.*, **ii**, 155.

Elam, J. O., *et al.* (1958): *J. Amer. med. Ass.*, **167**, 328.

Eve, F. C. (1932): *Lancet*, **ii**, 995.

Fothergill, A. (1795): 'A New Inquiry into the Suspension of Vital Action in Cases of Drowning and Suffocation', Bath.

Hall, M. (1856): *Lancet*, **i**, 229, 393; **ii**, 5.

Karpovich, P. V. (1953a): 'Adventures in Artificial Respiration', New York, p. 17.

—— (1953b): *Ibid.*, p. 116.

—— (1953c): *Ibid.*, p. 151.

——, and Hale, C. J. (1951): *J. appl. Physiol.*, **4**, 467.

Leroy-d'Etiolles (1829): *J. Physiol. exp.*, **9**, 97.

Lewins (1840): *Edinb. med. surg. J.*, **54**, 255.

Molloy, P. J. (1961): *Lancet*, **i**, 49.

Nielsen, H. (1932): *Ugeskr. Læg.*, **94**, 1201.

Safar, P., Escarraga, L. A., and Elam, J. O. (1958): *New Engl. J. Med.*, **258**, 671.

Schafer, E. A. (1904a): *Med.-chir. Trans.,N.S.*, **69**, 609.

—— (1904b): *Proc. Roy. Soc. Edinb.*, **25**, part 1, 39.

—— (1909): 'Artificial Respiration in Man', Philadelphia.

Silvester, H. R. (1858): 'The True Physiological Method of Restoring Persons Apparently Drowned and Dead and of Resuscitating Stillborn Children', London.

Tossach, W. (1744): 'Medical Essays and Observations', vol. 5, part 2, p. 605.

Webster, J. M. (1957): *Brit. med. J.*, **ii**, 1314.

THE TRANSPORT OF INJURED PATIENTS

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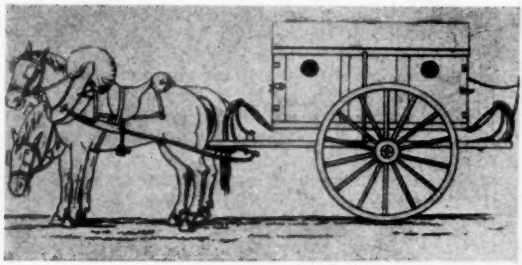
The progress of transportation of the injured is far behind the rapid progress of medical science. This is largely due to the fact that few doctors really concern themselves with this important aspect of the care of the injured. In the Services more progress has been made as the medical officers are directly concerned with the evacuation of the wounded; so it should be in a National Health Service. The ideal is an economic, safe, simple, comfortable and speedy method.



(By courtesy of Thomas Nelson and Sons Limited)
Fig. 1.—Larrey's *ambulance volante* (Guthrie, 1945).

HISTORY

Before the Napoleonic Wars no attempt was made to collect the wounded and take them to a surgeon for treatment. A surgeon would be present at the battle and his tent suitably marked with flags, the wounded finding their own way, as best they could, to his tent.

Baron Larrey (1766-1842) introduced his 'ambulances volantes' (fig. 1) during the Napoleonic Wars (Guthrie, 1945). These were two-wheeled vehicles drawn by two horses, a crude box being mounted on the vehicle in which the wounded man was placed. Such a journey must have been rough and probably harmful to the patient but it was the start of an ambulance service for the collecting and transporting of the injured. Progress was slow and by the end of the 19th century, converted cabs (fig. 2) were being used in England for the transport of the sick. Street ambulances were hand-wheeled stretchers (fig. 3) and were used for street accidents.

With the development of the motor vehicle, ambulances have improved in comfort and speed. As we know them today they are relatively comfortable but leave much to be desired. The present-day ambulances bounce and sway and there is no sound proofing. The discomfort caused by these drawbacks is often exaggerated in the seriously ill patient and is unpleasant for the attendant, especially on a long journey. The space to tend the casualty is inadequate and with the stretcher placed to one side the attendant has to stoop or crouch over the patient. These disadvantages are mainly due to the fact that ambulances today are modified commercial vehicles. No attempt so far has been made to produce an ambulance specifically for the purpose of transporting the ill patient.

Gissane (1955) has devised a foam rubber stretcher which is hollowed out to conform to the contours of the average adult lying supine. This is mounted on a frame with special suspension (fig. 4). The aim has been to devise a stretcher which acts as a splint and to have special suspension for the stretcher to absorb vehicle movement. In addition, the stretcher and carrier are centrally placed allowing easier access to the patient. Bothwell (1960) describes the design of a front-wheel-drive ambulance which can be lowered to the ground for ease of loading, and raised to give sufficient

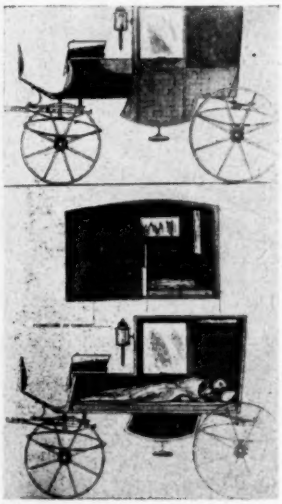


FIG. 2.—Converted cab ambulance (*Radio Times Hulton Picture Library*).

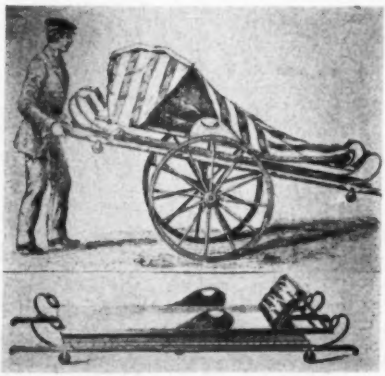


FIG. 3.—Dr. Gauvin's hand-wheel litter. The lower illustration shows the stretcher removed from its wheels (*Radio Times Hulton Picture Library*).

ground clearance over rough ground, with special suspension to overcome sway, bounce and jolting (fig. 5). Such an ambulance would add greatly to the comfort of the patient and crew, so that relatively long journeys could be made in comfort, which is far from so today.

METHODS OF TRANSPORT BY LAND

Hand carriage.—This is probably the oldest method of transporting the injured. Today it is a valuable method in certain circumstances, particularly for short journeys over difficult terrain.

It is a method which can be carried out by one, two, three or four bearers depending on the number available and the method used. One bearer can use the pick-a-back or fireman's lift method. Two bearers can use the 'hand chair' or a stretcher. Three and four bearers make stretcher-carrying easier, either by dividing the load or acting in relays. The obvious dangers of some of these rough and ready methods need no emphasis, though they may be the only means of moving the casualty to safety. The main objection to hand carriage, except for a very short journey, is that it is too slow and too tiring.

The Army have developed a 'Burma improvised stretcher' which is simple and

made from two pieces of timber and a blanket (fig. 6). The Neil Robertson stretcher is an essential piece of equipment for rescue work, particularly in mountaineering and mining accidents. This stretcher is made of bamboo and canvas and virtually wraps round the patient splinting and protecting him from further injury, and allows for the raising and lowering of the patient in the vertical position, if necessary.

Vehicular transport.—Today the road ambulance is the most readily available method of transporting the injured and the most satisfactory for reasonable distances. It is available in all towns, so that with few exceptions an ambulance should not be more than 50 miles away from any accident, which at the most would necessitate a two-hour delay. In large towns ambulances should be strategically placed so that they do not have to cross the whole town, with all its traffic problems, to the scene of the accident. This does occur in many towns where the ambulances are maintained at a single depot. Ambulances should be in wireless communication with their base and the hospitals they serve.

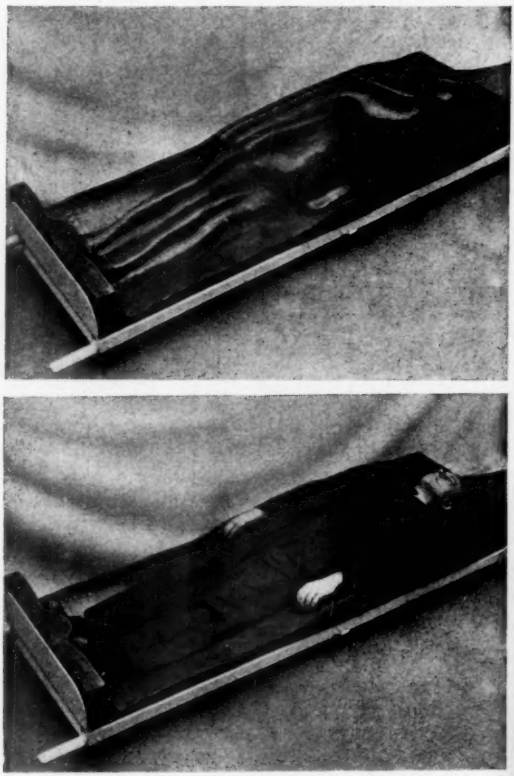


FIG. 4.—Gissane's foam rubber stretcher.

During the last war jeeps were used to carry stretcher cases; such casualties had a rough ride and were often considerably distressed by it. This is true of all improvised transport and it is often better to wait for an ambulance than to utilize any available transport. The use of the latter may increase pain and bleeding and the available space makes it impossible to tend the patient even to the extent of maintaining an adequate airway, which could more easily be maintained while waiting for an ambulance.

Train.—Hospital trains are an excellent method of moving large numbers of casualties long distances with speed and comfort in wartime. Their main disadvantage is that special arrangements are necessary to run such a train.

Further, road ambulances are still required to transport the casualties from rail head to hospital. Aircraft will probably supersede such trains in future.

METHODS OF TRANSPORT BY SEA

The lifeboat.—Round the coast of Britain the lifeboat undertakes most of the rescue work: rescuing swimmers and the occupants of boats in distress. Many of these, however, may have suffered injury as well as the effects of exposure, exhaustion or immersion, so that urgent resuscitative measures may be necessary under difficult conditions.

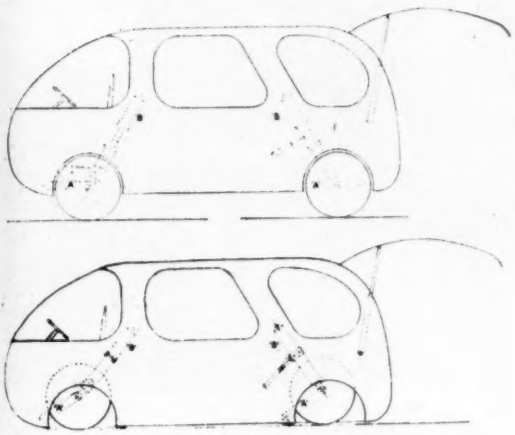


FIG. 5.—(*a*) Bothwell's suggested FWD ambulance with suspension height-adjusting mechanism. Front and back wheels are pivoted on trailing links so that they can pivot upwards into the body, the floor therefore coming to rest on the ground as shown in (*b*).

Launches.—Area Commissioner R. H. Blanchford has developed an ambulance motor launch, 'The Flying Christine', manned by St. John Ambulance men.

It deals with the rescue work of accidents on the cliffs of the Channel Islands, and the transport of the sick to Guernsey from the smaller islands. The launch is fully equipped for first-aid care and the personnel are trained in first aid. On the same lines the R.A.F. developed the air-sea rescue launches during the last war. These continue to operate in peacetime, being based on the Mountbatten Air-Sea Rescue headquarters at Plymouth. They have the advantage of speed and a far greater range than the ordinary launch. They are fully equipped for the primary care of the injured and carry a sick-berth attendant who is in constant communication with the base and so able to obtain medical advice if need be.

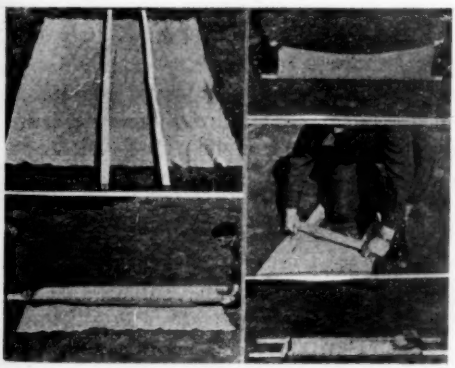


FIG. 6.—The 'Burma improvised stretcher'. (*By courtesy of Colonel J. C. Watts.*)

Hospital ship.—This, like the hospital train, has no place in peacetime. It is designed essentially for the transport of large numbers of sick and injured as occur in war. Their equipment was excellent for they were virtually

floating hospitals. In future, like the hospital train, they will probably be superseded by aircraft.

METHODS OF TRANSPORT BY AIR

The aeroplane.—Air ambulances will undoubtedly become the most satisfactory method of transport for long distances. They were started before the last war, in the early 1930's, but with the advent of war much larger aircraft were used for this purpose and allowed for the transfer of many casualties with speed and comfort. In peacetime small aircraft are satisfactory for it is rarely necessary to transport more than one or two casualties at a time. The main disadvantage of the aeroplane is that it requires special landing facilities—usually outside large towns, so that a slow ambulance journey may be necessary at the end of the flight which may well take as long as the flight, and much of the benefit of a quick flight is lost.

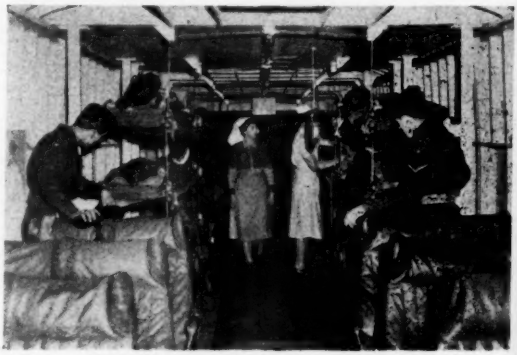


FIG. 7.—Westland Rotodyne. (*By courtesy of Colonel J. C. Watts.*)

The helicopter.—The helicopter has the great advantage of vertical take-off and therefore requires very little landing space; in fact it is able to load and unload without actually landing. It is in this field that the future of transporting the sick and injured lies. At present their use is considered expensive but when it is realized that such craft are in use and are being maintained by the Services, further development of the use of helicopters in civilian injuries would seem to be only a matter of cooperation with the Services. Before such a service can be more widely used to full advantage, hospitals will have to make space available for these machines to land. Most of the large hospitals, treating major injuries, are in large towns and such space is not available at present. New hospitals will have to look to the future and make heliport space available. This could be in an adjoining field or, preferably, to save valuable land space, on the roof of the hospital. With such facilities the injured could be transported quickly from the scene of the accident right to the roof of the hospital, avoiding all the delay that exists at present by having to land at airports.

There are, of course, disadvantages in the present type of helicopter. They are more cramped for space than the winged aircraft and they are noisier. These disadvantages, however, are only a matter of development.

Already the Army are using the Westland Rotodyne (fig. 7), which can accommodate a large number of stretcher and sitting cases. For peacetime purposes these are, of course, too large; something in between is required.

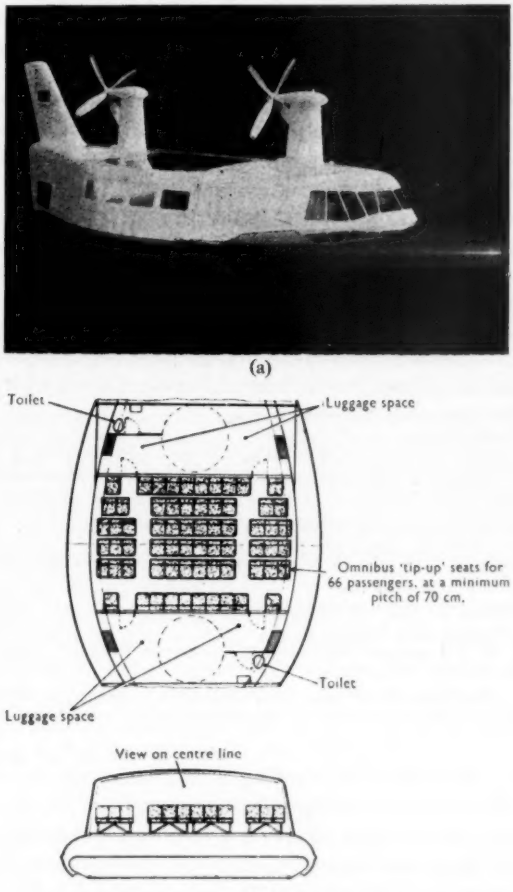


FIG. 8.—The Hovercraft. (*a*) Photograph of model. (*b*) Plan of accommodation. (*By courtesy of the Westland Aircraft Co. Ltd.*)

The hovercraft.—This is still in its experimental stage but has great possibilities for the future, particularly in air-sea rescue work.

In its present state it is a 25-ton craft capable of carrying 66 passengers (fig. 8) at a speed of 70 knots with an operational range of 200 nautical miles. In its present form its main disadvantages are that it has a hover height of only 1½ feet (45 cm.) and could not be used in rough weather. Also it requires special landing bays which limit its usefulness. These, however, are developmental problems.

TIMING THE JOURNEY

This may be of crucial importance and require careful consideration of the circumstances. The number of injured, the relative urgency of their several conditions, the distance to be travelled to hospital and whether this is small or large and well equipped will influence the decisions governing movement of patients. In general, the nearer the services of a well-equipped general hospital the more promptly all seriously injured persons should be moved to it. Those whose lives are endangered by bleeding or respiratory disturbance need prompt attention. Serious injuries without immediate danger to life will best be moved as quickly as possible and should not suffer from a short journey. When the nearest general hospital is a long way away it may be better to send on the less seriously injured, who can stand the journey, at once and move the worst cases to the nearest hospital where resuscitation can be carried out with local resources or by an emergency team summoned for the purpose.

With large disasters confusion and error are the main danger and a well-informed control point at the scene of the accident can do much to reduce it. Sorting of cases is not easy but the following order of urgency is suggested:—

(1) Severe bleeding—internal or external.
Severe head injury.
Severe embarrassment of breathing. Some cases of gassing may be better retained because of the difficulties of providing artificial respiration in an ambulance.

(2) Large wounds, especially of the abdomen or buttocks.
Multiple fractures, especially of pelvis or femur.
Large burns affecting more than 20 per cent. of the body.
Closed abdominal injuries.
Unconsciousness without evident deterioration.

(3) Smaller wounds and fractures.
Injuries of the spinal cord without embarrassment of breathing or other injuries.
Burns of less than 15 per cent. to 20 per cent. of the body surface.
The dead and dying should not be given priority over the living.

CHOICE OF TRANSPORT

Head injuries.—Provided that bleeding is controlled and the blood loss has not been great, head injuries travel better by air: the journey is smoother and reasonable altitude has no adverse effects. They travel more safely early than late provided that adequate lung ventilation is maintained, so some delay in arranging air transport would not outweigh the disadvantages of a road ambulance for a long journey.

Pelvic injuries.—Some pelvic injuries produce considerable blood loss into the surrounding tissues, so that these patients are usually suffering from considerable hæmorrhagic shock and movement causes severe pain. Such patients travel badly, for the vibration and jolting of a long road journey increase the bleeding and thereby the shock, and they may die from bleeding during the journey. No patient with a fractured pelvis should be taken a long journey unless a blood transfusion is maintained throughout, and this is often difficult. It may be wiser in some cases to keep the patient

in a small hospital for a few days, to stabilize his blood volume and allow the bleeding to stop by natural processes. When, however, the bladder, urethra or rectum has been injured expert treatment is urgently necessary and the risk of moving the patient may have to be taken, if expert help cannot come to the patient.

Chest injuries.—Severe chest injuries travel badly and may require artificial respiration, which is almost impossible inside an ambulance without special equipment. If an endotracheal tube is passed or a tracheostomy performed at the smaller hospital before the journey, bronchial toilet and the administration of oxygen are made easier. Interference with the pulmonary ventilation makes these patients more susceptible to changes in atmospheric pressure, so that air travel is not without risk unless the flight is made at very low altitude. This may be difficult in mountainous and large industrial areas, in which case the casualty must be made as fit as possible and transferred to the special centre by road.

Spinal injuries.—Spinal injuries with cord damage travel better by air than by road for the journey is smoother. Of all injuries the cord injury is probably in greatest need of treatment at a special unit. Provided there are no other injuries to cause hæmorrhagic shock, these patients can be transferred almost at once; delay increases the risk of pressure sores and urinary infection if catheterization becomes necessary. Delays of up to eight hours from the time of injury are reasonable and this should allow plenty of time to arrange an air ambulance. There are few special spinal units in this country so that distances may be quite considerable and a journey by road may be distressing and even harmful to the patient.

Large wounds.—Early treatment for large wounds is important but time spent at a small unit in resuscitation is worth while before a long journey. If the journey is short, a direct route to the major hospital from the scene of the accident is justifiable provided the patient is comfortable and that all major bleeding has been controlled. Air travel need only be considered if the journey is going to be very long.

AMBULANCE EQUIPMENT

The question of ambulance equipment always evokes considerable discussion. It is impossible to cater for every possible contingency; only life-saving equipment and equipment for the patient's comfort should be carried. It should be of reasonable bulk so that it can be conveniently stored. Town ambulances working an area near a major hospital require the minimum of equipment for they can transport the casualty to hospital in a matter of a few minutes. The only first aid necessary is to ensure an adequate airway and to stop bleeding. Ambulances working country areas may have considerable distances to travel and may justifiably carry more equipment than town ambulances.

Drugs.—In London, ambulances carry morphine, chloroform, adrenaline and nikethamide (Scott, 1961). Others suggest that there is no need for

ambulances to carry chloroform, intravenous anæsthetics, morphine or adrenaline. Between these opposing views there must be a happy medium.

Morphine.—Morphine undoubtedly is a useful drug for an ambulance to carry, particularly in country areas so that the patient can be made comfortable for a long journey, but it must be given intravenously. In traumatic shock with marked vasoconstriction, a subcutaneous injection of morphine is only very slowly absorbed and does little to relieve pain. If given slowly, and intravenously, relief of discomfort occurs quite quickly with relatively small doses; only rarely is it necessary to exceed $\frac{1}{6}$ grain (10 mg.).

Anæsthetics.—Most modern anæsthetics require special apparatus which cannot be carried conveniently in an ambulance. Chloroform, on the other hand, is cheap and easy to store. It is a safe anæsthetic in skilled hands, but it is uncommon to find doctors today who are familiar with its use and aware of its dangers. Apart from the inherent risks of chloroform any anæsthetic given at the scene of the accident is fraught with the danger of inhalation of vomitus, for the patient is not prepared for anæsthesia and patients in traumatic shock are at great risk with any form of anæsthesia. Before using chloroform in such circumstances the risk of death from the anæsthetic must be carefully assessed against the risk of immediate death from the particular accident.

It is reasonable therefore for a country ambulance to carry chloroform and leave the particular doctor at the scene of the accident to assess the risks for himself. In towns there does not seem to be the same justification for its use, for if an accident is so serious that an anæsthetic is required, it is wiser to call on the nearest major hospital to send out a mobile surgical team with adequate equipment for the anæsthetic and the operation.

Adrenaline and nikethamide.—These are of little or no value in traumatic shock. Their inclusion in the ambulance equipment therefore seems superfluous.

OXYGEN AND TRANSFUSION APPARATUS

Oxygen is rarely required but when it is it is usually an urgent need, as in severe chest injuries and gas poisoning. A small supply with a suitable mask is therefore a justifiable piece of equipment to carry in any ambulance, but the distinction between cyanosis due to obstruction and to other causes must be carefully assessed or obstruction may go unrelieved.

Transfusion.—Blood transfusion may be required to save life or make a patient fit to stand a long journey. In towns there is rarely any call for a blood transfusion at the site of the accident for the patient can be transferred to hospital in a matter of minutes. Time taken to put up a transfusion only delays the transfer of the patient and is not justifiable. Nor is it easy in the circumstances prevailing at the scene of the accident to observe asepsis or in many cases to find a suitable vein for they are probably all in spasm if the case is so serious that transfusion is considered necessary. In country areas the problem is a little more difficult for the long journey may well cause further bleeding, particularly in trunk injuries when the control of

bleeding may not be possible. On the other hand, a transfusion is difficult to maintain in an ambulance on the move. The contents of the bottle and the drip chamber tend to froth, and the needle may block or even come out due to the 'whipping about' of the tubing.

Blood requires a special container to keep it cool which adds considerably to the bulk to be carried. Plasma, however, or dextran can be used instead and could reasonably be carried in ambulances which deal with accidents over a large area. It is wiser, however, to transfuse the patient before the journey in case the transfusion stops while the ambulance is in motion. Few modern ambulances have any facilities for fixing the transfusion bottle, so that the difficulty of maintaining the infusion is aggravated.

SPLINTS AND DRESSINGS

Splints.—The Thomas splint is the only splint worth while carrying in the ambulance. It can be used for any fracture between the hip and the ankle, and is comfortable if properly applied. Fractures of the upper limb can be suitably immobilized by fixing the upper limb to the trunk with bandages, so that no special splints are necessary. When the journey is short, time should not be spent applying splints; this only delays transfer to hospital and the patient can be made comfortable by packing the appropriate limb with rolled blankets and resting it on a pillow.

Dressings.—A good supply of dressings is always necessary for the covering of open wounds. Large dressings ready packed and sterile are invaluable for not only will they cover fairly large wounds but have sufficient wadding fixed to them to allow adequate pressure to be applied to control bleeding. For very large wounds, over 8 x 10 inches (20 x 25 cm.), sterile ready-packed dressings are not available. Small packs of similar type are necessary for the covering of the smaller wounds which may be bleeding and contributing to the hæmorrhagic shock. Bandages and slings are necessary for fixing splints or fractures of the upper limb to the body.

AMBULANCE CREW

The crew should be trained first-aiders specially trained in the care of a transfusion during a journey. They should pay particular attention to the patient's general condition, noting progress or deterioration; maintain an adequate airway and good lung ventilation, by artificial respiration if necessary; see that the splint is secure and that bleeding is well controlled by firmly fixed dressings. On arrival at hospital they should give to the receiving doctor what information they can of the accident and the patient's progress since the accident. Until there is specialized training of ambulance crews careful and precise instructions must be given to the crew by the doctor before the journey.

References

Bothwell, P. W. (1960): *Publ. Hlth (Lond.)*, **74**, 459.
Gissane, W. (1955): *The Practitioner*, **175**, 468.
Guthrie, D. (1945): 'A History of Medicine', London, p. 338.
Scott, J. A. (1961): *Brit. med. J.*, **i**, 606.

FIRST AID IN THE FACTORY

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It may appear strange that whilst all the other articles in this symposium have referred to first aid by systems or specific injuries, first aid in the factory should command a separate article. It may be argued that first aid for a particular injury should be the same whether it occurs on the sports field, in the street, or in a factory. The difference arises, however, from the fact that in industry the tools of the job are readily available, as are the trained first-aiders to use them. Moreover, the subject deserves special mention because of the vast size of the problem and because of new developments in this field.

THE PROBLEM

There are in Great Britain some quarter of a million factories, some large, employing many thousands of workers, but the majority so small that there may be only 5 or 10 employees. From this quarter of a million factories there arise every year almost 200,000 injuries which lose three days or more from work, and which are reportable to the Factory Inspectorate of the Ministry of Labour and National Service. These are to a large extent the cases which find their way into the casualty rooms and accident departments of hospitals. In addition to these cases, however, it has been recently calculated that there are 48 million injuries (document prepared by the Association of Industrial Medical Officers for the Sir Harry Platt Committee, 1961) which never reach hospital, but are treated either by doctors and nurses in large factories, or by first-aiders in small factories. It is important that it should be recognized that many of this vast total of injuries are being treated, many of them quite efficiently, by first-aiders. If all these cases were to be treated in hospital, industry would suffer serious and endless delays and hospital casualty departments would be inundated.

Analysis of typical samples of this total of injuries which occur in industry annually, reveals that approximately one-third are lacerations—mostly of the fingers and hands. The vast majority of lacerations are small clean cuts which require no more than thorough cleansing with a suitable non-irritant agent such as cetyltrimethylene ammonium bromide, and covering with an appropriate sterile dressing such as a waterproof adhesive. Were appropriate treatment not readily available on the shop floor many of these injuries would go untreated and a proportion would no doubt become septic and lead to time off work with its attendant pain, loss of wages and loss of production. A further one-third of the cases are eye injuries—mostly foreign bodies, which are loose and can be easily removed by a first-aider with a swab of cotton-wool. If trained first-aiders were not available, many of these

foreign bodies would be removed by a workmate with a matchstick or penknife blade with all the hazards that this implies. The remainder of the injuries occurring in industry contain a mixture of strains, bruises, burns and fractures many of which are also treated in the larger units of industry where good medical services are provided.

It is evident therefore that there is a need for two types of first aid in industry: the accepted version which is rendered to serious injuries before their removal to the medical department or the hospital, and the less well-recognized version which offers definitive treatment for minor injuries and illness.

THE 'NEW LOOK'

The 'First Aid Box in Factories Order, 1959', has drawn attention to the treatment of minor injuries by first-aiders. A new standard of contents of first-aid boxes has been introduced, bringing them into line with modern ideas of wound cleansing and covering with sterile gauze dressings. All antiseptics have at last been eliminated—they not only lured first-aiders into a false sense of security but brought such troubles as sensitivity dermatitis in their train. The training of first-aiders is dealt with in the 'First Aid (Standard of Training) Order, 1960', which demands that not only should first-aiders be trained in modern principles but also that they should possess a current certificate of their proficiency to practise their art, and that the certificate should be renewed every three years. This will increase the demand for lectures and training facilities, some of which will be met by industry itself, but some will no doubt be provided by the existing voluntary societies such as the St. John Ambulance Association, the British Red Cross Society and St. Andrew's Ambulance Association.

The standard textbook of these associations, 'First Aid', is a good primer for training, but men and women who practise first aid in industry will demand a more practical approach than this book gives them. There are other textbooks on the market concerned with first aid such as Mustard's book written for the Canadian St. John Ambulance Brigade, and 'Advanced Industrial First Aid' (Trevethick, 1947). It is particularly opportune that a new textbook has recently been published, written by Lord Taylor and his colleagues (1960) of the Harlow Industrial Health Service, which provides an excellent foundation on which to build a course on industrial first aid. This book has approached first aid with a refreshing understanding of the situation and much elaborate and useless matter has been discarded. As an example, shock has been explained on the basis of fluid loss from the circulation by dilatation of capillaries, fluid escape to the tissues and sweating. Treatment demands minimum and careful handling of the patient, and evacuation to hospital for replacement of the lost fluid. Fluid replacement by sweet drinks at the first-aid stage has no place since many patients will receive an anæsthetic. Many trivialities, especially elaborate bandaging and splinting of minor injuries, have also been eliminated so that the seriously injured patient can be dealt with simply and expeditiously and rapidly

evacuated to hospital. Finally first-aiders are taught to recognize simple injuries and indisposition which can be treated by them on the spot and returned to work. Official recognition that first-aiders can treat these minor conditions should increase the interest and usefulness of first aid in industry.

It is often not recognized that in the best industrial medical establishments facilities for the treatment of injured and ill patients goes far beyond first aid. Lacerations can be sutured under aseptic conditions, fractures x-rayed and treated, and for all cases there is a follow-up service which ensures a complete recovery and rapid return to work in a high proportion of cases. Those who are unfortunate enough to suffer a permanent disability are resettled in suitable work—often only successfully accomplished because of the intimate knowledge of the factory and types of work performed therein, by the industrial medical officer.

TRAINING FIRST-AIDERS

The increased demand for training of first-aiders will make great demands on the time of doctors—not only those engaged in industry but many who are concerned with teaching first aid outside the factory. It is essential that these doctors should recognize the new standards which are required and amend their teaching accordingly. The teaching of first aid is by no means easy since even now the scope is limited. The greatest use should be made of films, film strips and demonstrations with models. Competitions are commonly used as a means of training and stimulating interest. Unless great pains are taken in staging the accident, making up the patient and arranging the marking sheet the whole purpose can be defeated. The tragedy of competitions is that they are often a means of perpetuation of much that is unrealistic and trivial, to the neglect of essentials such as the maintenance of a clear airway and the prone or semi-prone position in an unconscious patient. Encouragement may be given to elaborate bandaging of a minor injury to the detriment of the patient generally and his speedy evacuation. The most useful feature of competitions is to provide practice in the comprehensive approach to a patient, distinguishing serious injuries which require treatment, from minor injuries which can be ignored.

It is at last being realized that medical services including first aid are needed elsewhere than in the factory. Shops, offices and agriculture have their problems, not only from injury by physical violence, but also from toxic hazards, which demand skill and care at the first-aid stage.

Doctors who teach first aid must therefore keep abreast of the times and avoid perpetuation of some of the humbug which has encumbered the first-aid curriculum for too long.

References

Mustard, R. A. (1955): 'Fundamentals of First Aid', St. John Ambulance Association of Canada, Ottawa.

Taylor, Lord, *et al.* (1960): 'First Aid in the Factory', London.

Trevethick, R. A. (1947): 'Advanced Industrial First Aid', United Steel Companies.

COMPARATIVE TREATMENT OF GRAVITATIONAL LEG ULCERS

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EVER since man adopted the erect posture instead of proceeding on 'all-fours' he has been subject to various complaints due to his imperfect adaptation to the vertical, i.e. a perpetual struggle against gravity. Common among these conditions are varicose veins and the leg ulcer of venous origin which may or may not be a 'varicose ulcer' but is always a 'gravitational leg ulcer' in that the fundamental cause is an inability of the veins to return the blood satisfactorily against the force of gravity. Supporting bandages have been used for their treatment through the ages. The ideal type of bandage is one which will remove the œdema quickly and heal the eczematous skin so leading to subjective relief and a speedy healing of the ulcer. The exercising of the calf muscles to remove œdema is of equal importance. This effect was understood by William Harvey but has not attracted much attention until recently.

The object of the investigation now reported was to study unselected cases of leg ulceration from their first attendance at the clinic and, in particular, their response to a standard treatment with a soft medicated bandage ('dalzoband no. 5') next to the skin and an elastic adhesive diachylon bandage ('lestreflex') applied to cover it. Alternate cases were put on to Unna's paste bandages as controls, this being the former method of treatment in most hospitals.

SCOPE OF INVESTIGATION

Over a period of five months all new cases of leg ulceration were accepted for this survey. At first they were allocated alternately to groups A and B for treatment. Group A (the controls) were treated with Unna's paste bandages, and group B with 'dalzoband no. 5' and 'lestreflex'. This system broke down slightly as we were asked to accept certain patients from within the hospital who had failed to heal with other treatments (including Unna's bandages) and these had to be put into group B. At the first attendance a detailed history was taken and records were made of weight, blood counts and sedimentation rates and swabs taken from each ulcer for bacteriological investigation. Treatment was then started and patients were seen every one or two weeks according to the severity of their ulcers. Bandages were changed at each attendance.

In the same clinic we have also collected a series of chronic cases who had been attending the clinic for some time (group C) and were successfully treated with the 'dalzoband' and 'lestreflex' technique. Previously they had had various forms of treatment with bandages (e.g. Unna's, 'viscopaste'), or physiotherapy or skin grafting, with little or no response.

HISTORY

Of the 30 patients in groups A and B, 10 were men and 20 were women. Nine were under 50 years of age, the youngest being 34 (case 6) and the eldest 81 (case 14). Five of the patients were employed as cooks or chefs, and several others were in occupations which involved standing all day. Six elderly patients lived alone.

Only ten patients had not had ulcers previously. Of the 30 patients four had post-thrombotic ulcers. Twenty had varicose veins, some of which had been treated by ligation, some by injection and some not at all; five of these had a history of phlebitis. In two patients the ulcers were secondary to arthritis, and in three no cause was found.

Grade	Group A	Group B
I	5	5
II	7	4
III	4	5
IV	0	3
	16	17

TABLE I.—Distribution of different grades of ulcer between patients in a control group (A) treated with Unna's paste bandages and those treated with 'dalzoband' and 'lestreflex' (B).

The duration of the ulcers varied between two days and five years. Six patients, including those with by far the largest ulcers (cases 16, 18 and 30), came from other clinics in the hospital where they had been treated with various dressings and bandages (including Unna's) for long periods, without success. The other 24 patients came straight from their own general practitioners. They had nearly all been treated with various ointments and creams with or without crêpe bandage. Some had had antibiotic creams. Only one had been treated with an elastic adhesive bandage.

CONDITION ON FIRST ATTENDANCE

In size, the ulcers varied from 0.5 cm. in diameter to enormous ulcers, such as case 18, in which most of the lower half of the leg was involved, and case 30 in which the ulcer was at least 20 cm. across, black and offensive. No accurate means of measuring the ulcers could be devised as many were of very ragged shape and some were ill-defined, being surrounded by a large area of eczematous skin and they varied considerably in depth. They have therefore been divided somewhat arbitrarily into four grades: grade I, the very small and superficial ulcer; grades II and III, the intermediate ones; and grade IV, the very large ulcers. Table I shows the distribution of the four grades of ulcer between groups A and B.

All except three of the patients complained of pain, and most of them were taking codeine tablets regularly day and night.

Hæmoglobin estimations and full blood counts were performed at the first attendance. Only in three instances was the hæmoglobin found to be under 80 per cent. Iron tablets were given to these patients, and, especially in case 5, there was a marked improvement both in the ulcers and in their general health. The erythrocyte sedimentation rate (E.S.R.) was determined at the first attendance and repeated after some weeks' treatment to see if

it would give any guide to progress. Patients with large ulcers generally had high rates but these did not necessarily drop as the ulcers healed; presumably the underlying arthritis, or some other perhaps general condition, had more influence on the E.S.R. than the ulcers. A swab was taken from each ulcer and sent for bacteriological investigation. Many different

(a) (b)

FIG. 1.—Response of gravitational ulcer (case 16) to treatment with 'dalzoband' and 'lestreflex' bandages: (a) before treatment; (b) after four months' treatment.

types of pathogens were grown; *Staphylococcus aureus* was the commonest (11 cases), followed by *Streptococcus pyogenes* and *Proteus vulgaris*.

All patients were weighed and only seven were considered overweight.

PRELIMINARY TREATMENT

Patients received similar guidance on wearing good supporting shoes, exercising their calf muscles, walking normally and raising the foot of the bed at night to combat œdema. In a busy outpatient department it was not possible to give very detailed instructions, but the nursing staff cooperated by stressing these points to the patients whenever an opportunity arose. Some, on account of arthritis and foot deformities, were unable to exercise and to walk normally, and a few had so much œdema to start with that normal footwear could not be worn.

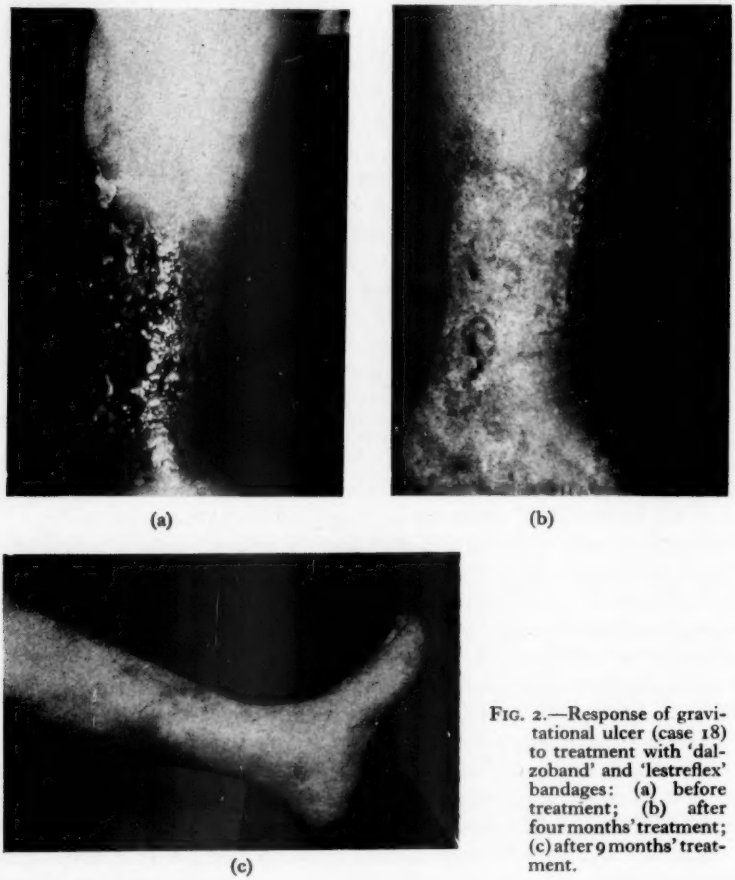
Varicose veins were not treated until after the ulcers were healed. In the case of ulcers which were obviously dirty or infected treatment started with soaks of potassium permanganate, 1:4000, twice daily.

No antibiotics were used, either locally or systemically, except in one control case (case 13). This ulcer increased in size after two Unna's bandages had been used and penicillin cream was applied daily for a week. Thereafter application of Unna's bandages was resumed.

BANDAGING TREATMENT

Group A received Unna's bandages which were applied by the nursing staff in the treatment room of the varicose clinic. *Group B* were bandaged in the clinic by a specially trained technician or by a nurse under his supervision.

Next to the skin a 'dalzoband no. 5' bandage was applied loosely and moulded to the leg from the root of the toes to the knee. (This is a zinc paste bandage containing 2 per cent. urethane and 5.75 per cent. calamine.) Over this the ventilated 'lestreflex' diachylon bandage was applied firmly up to the knee. For a few deep ulcers a small foam pad was used.



(a) (b) (c)

FIG. 2.—Response of gravitational ulcer (case 18) to treatment with 'dalzoband' and 'lestreflex' bandages: (a) before treatment; (b) after four months' treatment; (c) after 9 months' treatment.

In neither group were bandages left on for more than two weeks. The more severe cases had a weekly change of bandage.

RESULTS

The most striking feature was the marked subjective improvement in the group B cases. The majority felt much more comfortable. Some of the more severe cases felt less pain after only one bandage and reduced their codeine tablets. Case 26, for instance, reported that she 'slept well for the first time in years'. Figures 1 and 2 are typical of the results obtained.

Patients in group A did not appear enthusiastic in the same way, although their ulcers undoubtedly improved with treatment. The results were not so

Case No.	Grade	Age	Time to heal (weeks)	Remarks
1	II	66		Did not attend again after 5 months
	R. Lat.		12	
	R. Med.		Not healed in 5 months	
	L.		Not healed in 5 months	
3	II	52	17	Finally healed with bed rest
5	R. III	59	47	Changed to 'dalzoband' after 34 weeks
	L. III			
7	I	44	12	
9	R. III	70	—	Transferred to mental hospital after 8 weeks
	L. III			
11	I	64	—	Did not continue treatment after 1 week
13	II	43	Not healed in 5 months	Had penicillin in early stages. Did not continue treatment after 5 months
15	I	36	6	
17	I	66	4	
19	II	69	Not healed in 5 months	
21	II	56	—	Did not improve at all so changed to 'dalzoband' after 4 weeks
23	II	38	—	
25	III	66	—	
27	II	64	—	Both hips fixed, and ankles completely stiff

TABLE II.—Showing time taken to heal ulcers in a control group of 14 patients (group A) treated with Unna's paste bandages.

striking to the patients and they did not feel so much relief from pain. Three patients in this group defaulted and two did not reappear (cases 1, 3 and 11).

The time taken to heal the ulcers depended on numerous factors. Some had stiff ankles which tended to delay healing. Age and general condition were of great importance: e.g. case 14, who was 81 and hypertensive, took much longer to heal than a younger man such as case 6, although their ulcers were similar in size and equally painful. Case 6, who was only 34, had a large acutely painful ulcer recently developed. It was so painful that he had to miss work for the first week; yet it was completely healed in two months. Tables II and III show the length of time taken to heal ulcers completely in groups A and B. Cases 21, 23 and 25 which did not improve at all on Unna's bandages were transferred to 'dalzoband' and 'lestreflex'. Case 27 was complicated by fixed hips and completely stiff ankles: her ulcer improved only slightly with Unna's bandages and she was also transferred to 'dalzoband' and 'lestreflex' and healed in twenty weeks.

Group C.—This was a group of 10 chronic cases of ulceration who had

been attending the varicose clinic for some time and had undergone a variety of treatments without improvement. Their ulcers were all large ones (grade III). Between September 1957 and May 1958 they were treated with 'dalzoband no. 5' covered with either an elastic adhesive bandage or cotton crêpe, and they were healed in a few months (table IV).

DISCUSSION

The treatment was simple and inexpensive and infections were overcome without resort to antibiotics.

The 'dalzoband no. 5' and 'lestreflex' bandages combined to give a most satisfactory treatment for ulcers of any grade of severity, including all the

Case no.	Grade	Age	Time to heal (weeks)	Remarks
2	II	61	36	
4	II	72	8	Arthritis
6	III	34	10	
8	I	45	8	
10	R. II	41	10	
	L. II		8	
12	I	68	7	
14	III	81	36	Poor general condition
16	IV	59	Not healed	Very large chronic ulcer. Although not healed the improvement was considerable (fig. 1)
18	IV	65	35	Very severe arthritis and large chronic ulcer (fig. 2)
20	III	59	35	
22	I	55	5	
24	I	60	4	
26	III	72	28	
28	R. III	63	26	
	L. I		4	
29	I	35	4	
30	IV	48	Not healed	After 6 months reduced to 5 cm. × 5 cm.

TABLE III.—Showing time taken to heal ulcers in 16 patients (group B) treated with 'dalzoband' and 'lestreflex'.

grade IV cases. The 'dalzoband no. 5' is soothing, easy to apply, does not stick, and improves the skin surrounding the ulcer. There were no skin reactions. 'Lestreflex' supplies a firm and flexible support without being bulky. The method described overcomes the disadvantages of using an elastic adhesive bandage next to the skin.

Patients were able to wear shoes and walk normally, which in itself helps to heal ulcers. The patients said that they were more comfortable and needed fewer codeine tablets from the start of bandaging treatment.

The control group (A) on Unna's bandages did not experience the same increase of comfort and, on the whole, the ulcers took longer to heal (table V). Three patients in this group defaulted. Several control cases, after many weeks of Unna's bandages without success, were finally transferred to 'dalzoband no. 5' and 'lestreflex' and healed in a reasonable period of time.

Group C cases were all elderly women with chronic ulcers complicated by arthritis and deformities. They had previously undergone a variety of treatments for their ulcers without success. They were all well healed in

several months while on treatment with 'dalzoband no. 5', with or without elastic adhesive bandage.

CONCLUSIONS

(1) Thirty patients with gravitational ulcers were studied and divided into two groups for bandaging treatment. Group A (controls) were treated with Unna's bandages. Group B with a soft medicated calamine and urethane bandage ('dalzoband no. 5') next to the skin, and a ventilated elastic adhesive bandage ('lestreflex') over it. A third additional group (C) consisted of 10 very chronic cases.

Duration of ulcers	Time taken to heal	Remarks
5 years	3 months	
6 years	6 months	Had had skin graft previously
2 years	7 months	
1 year	8 months	Arthritis
Many years	7 months	
Many years	4 months	
3 years	8 months	Bilateral
15 years	8 months	2 very dirty ulcers
3 years	2 months	
17 years	7 months	Amputation had been advised

TABLE IV.—Results in 10 patients with large (grade III) chronic ulcers treated with 'dalzoband no. 5'.

Group	Grade	Total no. of cases	No. of cases healed	Average time taken to heal (weeks)	Improved but not healed in 20 weeks	No. who did not respond to treatment
A	I	3	3	7	0	0
	II	7	2*	23	2	3‡
	III	3	1†	47	1	1
	IV	0	0	0	0	0
B	I	5	5	5	0	0
	II	3	3	17	0	0
	III	5	5	24	0	0
	IV	3	1	35	2	0

*After 17 weeks' treatment, case 3 was finally treated with bed rest and healed.
†Case 5 was eventually treated with 'dalzoband' and 'lestreflex' after 34 weeks' treatment with Unna's paste bandages.
‡Includes case 24 who did not respond to either treatment.

TABLE V.—Comparison of rates of healing in groups A and B.

(2) All groups benefited from a planned regime of treatment and attention to general health. The 'dalzoband' and 'lestreflex' patients (groups B and C) were more comfortable and tended to heal in a shorter time than the control group (A).

(3) The use of these two bandages in combination proved suitable for all types and sizes of ulcers.

I would like to acknowledge with thanks the help and encouragement I received from Mr. Handfield Jones, who allowed me to treat the patients, also from Dr. Stanley Rivlin of the London Varicose Clinic who first demonstrated to me the bandaging technique I have used.

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MEDICAL PRACTICE IN THE LAND OF ANNA AND THE KING

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The Thailand of today is a far cry from the Siam of King Mongkut and his illustrious Welsh tutor, Anna Leonowens. Like most countries in S.E. Asia it has advanced rapidly since the end of the 1939-45 War. Towns have been modernized, communications improved, industries established, and the general standard of living raised. Nevertheless, in the field of medicine much remains to be desired. Whilst Bangkok has one doctor per 600 inhabitants, the rest of the country makes do with but one per 25,000, in spite of the fact that two medical schools are producing over 200 graduates annually.

Three categories of doctors are recognized: first-class, or those holding qualifications meeting Western standards; second-class, or those with limited knowledge, but often in charge of rural Government clinics and capable of dispensing the simplest drugs; and third-class or quacks, who rely on magic potions, incantations, cupping and blowing methods, scarification of tumours and the like to effect 'cures'. The majority of patients in outlying areas are still treated by second- and third-class doctors. Ignorance, superstition, local custom, fear of Western medicine and the easy procuring of drugs, making for self-treatment, all impede early diagnosis and result in patients presenting with advanced conditions often beyond medical help.

The following observations have been made during a five-year residence in Thailand, four years of which were spent in the northern province of Chiengmai, in hospital practice (180 beds) and in the course of occasional trips into the hills nearby with public health teams.

COMMON EMERGENCIES

The commonest emergencies are three in number: vaginal bleeding from incomplete abortion, vaginal bleeding in late pregnancy, and laboured breathing in young children associated with tonsillar or laryngeal diphtheria. Examples of the first of these average about one a day, requiring dilatation and curettage. The main reason for this high rate of abortion is undoubtedly the hard manual work the average Thai woman does—carrying heavy baskets over her shoulder to market, drawing water from the well and working in the fields. There is good evidence, however, that a certain number are due to criminal interference, perhaps arising from fear of yet another mouth to feed in a large family already in economic straits. Of all cases of vaginal bleeding in late pregnancy about 80 per cent. are due to placenta prævia, usually partial or marginal in type, and the majority come to Cæsarean section as an emergency procedure, the patient often exsanguinated and a poor surgical risk. These are usually multiparæ.

The third emergency, diphtheria, is still the scourge of babies and young

children; in spite of the efforts of the public health authorities, few receive prophylactic immunization. To make matters worse the patient is brought in late, with high fever, cyanosis and even unconscious. Tracheotomy is a nightmare in these small patients and the mortality rate is high. The incidence varies throughout the year and, although endemic, the disease has unpredictable cycles when as many as three or four patients come to operation in one week.

OBSTETRICS AND GYNÆCOLOGY

Inadequate antenatal supervision and labour in the hands of unqualified persons inevitably give rise to a high incidence of obstetrical complications. The commonest is transverse lie, often with prolapsed arm or umbilical cord, an example of which I have previously reported (Bisset, 1960). As many of these cases have been badly mishandled by village 'midwives' and crones before admission, they are often heavily contaminated. In transverse lie internal podalic version under deep anæsthesia and extraction as a breech is sometimes successful. More usually, however, these cases are seen late and rupture of the uterus is imminent; in these circumstances Cæsarean section under heavy antibiotic coverage is done. Ruptured uterus is not uncommon: six cases were seen during the past two years and all the mothers were saved. Three were due to transverse lie and two, possibly three, were known to have followed the injection of a pituitrin-like substance by the aforementioned village assistants. Rupture through a previous classical section scar is also seen. Depending upon the condition of the patient, ruptured uterus has been treated by simple suture of the tear in the uterus after extraction of the fœtus and placenta, with tubal ligation, or less often by subtotal hysterectomy. When it has been necessary to perform Cæsarean section on bad-risk patients, and with blood replacement limited, it has become the practice in this hospital to use the classical incision under local anæsthesia, intravenous thiopentone being injected before opening the uterus, and oxytocin being added to an intravenous infusion of either blood or glucose/water to assist contraction of the uterus.

Most women in this part of the country are multiparous having anything up to ten children, only four or five of whom reach adulthood, many dying in the neonatal period of fever or diarrhœa. The incidence of toxæmia is remarkably low and eclampsia rare. As might be expected, multiple labours in unskilled hands lead to a high incidence of cystocele, rectocele and prolapsed uterus, but comparatively few submit to surgery. Vesico-vaginal fistulæ and, less commonly, recto-vaginal fistulæ are seen, as well as occasional old third-degree tears with incontinence of stool. Most gynæcological surgery, however, is done for uterine fibromyomas and ovarian tumours and cysts. The occurrence of cancer of either the cervix or the uterus is rare, and during the past four years fewer than fifteen cases of carcinoma of the cervix have been seen—all too late for surgical treatment. Patients of means are sent to Bangkok for radium treatment as no such facilities exist elsewhere.

High multiparity leads also to a high rate of ectopic pregnancy, and as many as three cases have been operated on within a few days of each other. Indeed, any woman admitted pale, with a rapid pulse and vague abdominal discomfort is assumed to have an extra-uterine pregnancy until proved otherwise! Colpotomy or low abdominal paracentesis helps to confirm the diagnosis. It is always a cause of wonder to see some of these women come in after a long journey by bamboo stretcher, bullock cart, country bus or by rail and still survive. One took seven days to reach hospital! A fairly high incidence of pelvic inflammatory disease in the female population, with resultant adhesions in the Fallopian tubes undoubtedly contributes to this high incidence of ectopic gestation.

SURGERY

Among the surgical conditions encountered, stone in the renal tract occupies first place. Of all major operations performed in this hospital, one in nine is for removal of stones of the bladder, ureter, kidney or urethra, in that order. Bladder stone, whilst rare in the female, is very common in the male and in children of both sexes. The etiology of these stones is debatable but factors contributing to this state are undoubtedly poor diet, the high mineral content of the local soil and water, inadequate fluid intake and excessive perspiration with resultant highly concentrated urine.

Goitre is endemic, especially in the hills nearby, and assumes the colloid and non-toxic multi-nodular forms. Thyrotoxicosis is met with often and is found almost exclusively in women. Medical treatment is always uncertain and most patients submit to subtotal thyroidectomy. Ignorance and reluctance to consult qualified doctors lead to quite a few cases coming to hospital in a state of thyroid crisis and not a few die in spite of vigorous therapy.

Whilst cancer is probably as common in the East as it is in the West the incidence rate for various organs differs. Since it is contrary to custom to circumcise, and hygiene of the prepuce leaves a lot to be desired, it is hardly surprising that carcinoma of the penis is often seen. The eating of large quantities of bulky hot spiced food may have something to do with the comparatively large number of cases of carcinoma of the pharynx, œsophagus and larynx encountered. This, too, may account for the many cases of carcinoma of the stomach seen every year, often at the stage of pyloric obstruction and too late for radical surgery. Carcinoma of the colon and rectum is rare. It would be logical to deduce that breast feeding, which is the rule in these parts, offers some protection against cancer of the breast: only some twelve cases have been seen in four years. More than half were stage III and beyond.

Digestive disturbances and peptic ulceration are widespread, and all too often hyperperistalsis of the stomach and a palpable mass over the pylorus indicate the presence of almost total obstruction. Remarkably enough, acute perforation of an ulcer is one of the least common emergencies. Whilst gall-stones are usually thought of in terms of obesity, rich diet and the female

sex, this condition is quite common in this area where the diet is almost exclusively rice supplemented by a little fat and protein and obesity is not the rule. About 40 per cent. of stones are radio-opaque. Many textbooks indicate that appendicitis is primarily a disease of meat-eating people, but experience in this rice-eating part of the world belies this. Appendicitis is common in both sexes and at all ages. Owing to the habit of taking purgatives for any abdominal pain or discomfort, many present as a pelvic abscess.

As many of our patients are both debilitated and dehydrated, acute suppurative parotitis is sometimes seen after operation, in spite of every effort to remedy these defects preoperatively. Poor oral hygiene and dental caries, together with naso-gastric intubation for several days, all contribute to this state. All our cases have responded to incision and drainage, however, after antibiotics, corticosteroids and large doses of iodine have failed, even when there appeared to be little hope of recovery.

Generally speaking, fractures are much less commonly encountered than in more mechanized countries. Fractures peculiar to practice here are those sustained from falling off coconut trees while gathering nuts, or from roof-tops while re-thatching before the beginning of the rains, and result in compression fractures of the thoraco-lumbar vertebræ. Stab wounds and gunshot wounds are all too common, together with more exotic injuries resulting from being gored by buffaloes or elephants, and mutilating wounds from encounters with bear or tiger. Snake bite on the other hand is rare. Most patients either die or do not bother to come for treatment. The latter is usually the case.

MEDICINE

Most medical diseases seen in the West are met with in Thailand, but with a somewhat different incidence rate. Rheumatic heart disease is remarkably common. Whilst the acute form is not seen often, the later stages with valvular disease, even mitral stenosis and failure, are often met with. Females are affected more than males and most cases are below 40 years. Fever of unknown origin is a constant problem. Some of these are due to malaria—*P. falciparum* is the common agent in the foothills all around—but most are due to typhoid and respond satisfactorily to chlor-amphenicol. Incidentally, 'rose spots' and complications, such as hæmorrhage and perforation, are hardly ever seen. Tetanus is always with us and there are weeks when rarely is the hospital without at least one case. Most come in late, with trismus, tetanic convulsions and even opisthotonos. As many people go about barefoot and sustain scratches on their feet daily it is impossible to identify any one lesion as the infected one. Some 40 per cent. or so die, but only a few of the survivors have any residual weakness or palsy. Not a few cases are in the newborn, as a result of the umbilical cord having been cut with a contaminated piece of bamboo or a dirty knife.

Both leprosy and tuberculosis are endemic. Deformities associated with the former, such as claw-hand, drop-foot and thickened nasal bones, are to

be seen everywhere, but great efforts are now being made by Government and other agencies to treat cases early, both inside and outside leprosy colonies, throughout the country. Tuberculosis is a much greater problem and there are just not enough hospital beds to treat open cases. Public health groups are making strenuous efforts to instruct the public but until widespread practices, such as spitting everywhere, using communal bowls in drinking places and inadequately cleansing dishes at roadside food-stalls, are curbed and the segregation of the sputum-positive is enforced there is little hope of the present high disease rate letting up. Encephalomyelitis, with Japanese type B virus the probable incriminating agent, takes a heavy toll of babies and children and occasionally adults. Broad-spectrum antibiotics appear to help in certain cases. Hypertension is seen in adults and is often difficult to control even with the galaxy of hypotensive drugs at our disposal. Failure of the patient to take drugs in maintenance doses makes treatment unsatisfactory and many succumb eventually to kidney damage. The natives of this country seem to be quite prone to thalassæmia, or Cooley's anæmia, and more and more cases are being confirmed.

A recent study among females admitted to hospital showed approximately 60 per cent. to have intestinal parasites. Some had double and even triple infections. Hookworm and roundworm head the list followed by tapeworm (mainly *Tænia solium*), strongyloides, whipworm, threadworm, and *Clonorchis sinensis*. Contrary to the teaching in many centres, these parasitic infections do produce symptoms—often quite bizarre, such as 'heat in the abdomen' radiating to the chest and up to the neck. Persistent search of the stool is usually rewarding. *Endamœba histolytica* trophozoites are encountered less often than could be expected, even when symptoms of dysentery are marked.

Avitaminosis as such is not often diagnosed, but there is no doubt that the population as a whole, especially those living in the hills, do have an inadequate vitamin intake. This comes to light mostly in post-partum women, for whom popular beliefs require a strictly limited diet, and these women are admitted with a dry type of beri-beri, that afflicting the peripheral nerves. Scurvy and pellagra are not seen and rickets is rare.

SUMMARY

This is a record of a type of practice which is rapidly disappearing, even in the more primitive parts of the world. It is also the swan-song of a general practitioner about to turn surgeon. The incidence of disease in North Thailand is described and peculiarities to practice in a sadly under-doctored area, where popular superstitions compete with Western medicine, are noted. As in general practice elsewhere there have been moments of extreme frustration and disillusionment, fortunately compensated by not a few moments of profound satisfaction.

Reference

Bisset, J. (1960): *The Practitioner*, **184**, 488.

GENERAL PRACTITIONERS' FORUM

THE GENERAL PRACTITIONER AND RESEARCH

By C. G. LEAROYD, M.R.C.S., L.R.C.P.
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THE G.P. is the field-naturalist of that particular branch of natural history which is called Medicine. He or she watches humanity in its natural habitat, in and around the home; hears his future patient's fœtal heart and feels his kicks at uterine confinement; ties the Gordian knot which makes an individual; notes the lifelong partnership, by no means always harmonious, between heredity and environment; observes waves of invaders attacking various human tissues and assists in their repulse or assimilation or—rarely nowadays—feels the humiliation of their triumph; deals with a host of trivial complaints which may seem hardly doctor-worthy, but can be of prolonged significance; notes how the mind and the mood switch to meet changing conditions; sees men and women not as they would be seen by the world, but in the nude and confessional and, so much more lovable, suppliant for help; perceives the threat of death throughout life as a stimulant and watches with reverence death itself, commonly, as an unresisted ending.

With some 18,000 men and women of tested intelligence in this country spending their lives in general practice a vast store of original observations, deductions from them, working hypotheses, theories and systems of causation are piled up in their minds. Few have the time and the training and, above all, the assurance of tranquillity to put them into written words; they merely utilize the harvest of their experience in their own work and for their own comfort. That vast mass of treasure is almost untapped. We should be strange people if we did not have our own notions and enthusiasms and, although it may be rather pretentious to call them research, they do explore and seek to explain many parts of the huge field of Medicine. This essay is to display a few of the more lively ones in the mind of one, not very erudite, G.P.

LEUKÆMIA AND MALIGNANCY

There is no reason why we G.P.s should be excessively humble about our views, even in a highly specialized subject like malignancy. Jenner was not above listening to the gossip of a dairymaid. In 1894, a Dr. Fraser reported a case in which pernicious anæmia was temporarily cured by feeding the patient on bone marrow, which contains the intrinsic factor. What a mighty army of men and women in the next thirty-odd years would have been saved from a lemon-yellow death if that observation had been followed up with anything like the enthusiasm and the method with which the C.I.D. follow up an ordinary murder case. It was not the experts who spotted that

cœliac disease in children and some cases of steatorrhœa in adults are due to the gluten in bread; the observation was forced on the patients themselves when they were starved of bread in war-time Holland, and improved. It was an Australian ophthalmologist who spotted the connexion between rubella in early pregnancy and congenital defects, but the material for that deduction was available to many specialists and quite a number of G.P.s all over the world for years. It would be naïve to suppose that we have come to the end of the Great Undiscovered Simplicities.

I have a hunch that we may be missing clues to the treatment of leukæmia now. This in brief is the argument.

(A) The only patients ever recorded as having recovered from leukæmia naturally are some who suffered from tuberculosis. Here is the relevant passage from Sturgis's 'Hematology' (1955):—

'It has long been known that tuberculosis may have a profound effect on the course of leukæmia. This subject has been summarized by Jeffe and by Heinle and Weir. The latter report a case of a thirty-six-year-old male who undoubtedly had chronic myelogenous leukæmia for 4½ years. At the end of that time active tuberculosis developed which was the cause of death. At necropsy there was no evidence of leukæmia. They suggest that it is probable that some factor produced by the infection with tuberculosis altered the course of the leukæmia and caused the reticulo-endothelial system to revert towards normal. In reviewing the literature dealing with the association of these two diseases it is concluded by these authors that individual cases appearing in the literature may be classified roughly as follows:

(1) Those who have leukæmia for a considerable period of time and subsequently develop tuberculosis. This complication (a) may not alter the course of the leukæmia, (b) may modify it by diminishing the clinical and pathological signs of leukæmia, or (c) may cause the complete or almost complete disappearance of the clinical and pathological signs of leukæmia.

(2) Leukæmia or a leukæmoid blood picture may coexist at the time the patient is first observed with the development of one of the possibilities as given above'.

(B) Tuberculosis is a mighty mobilizer of the white cells. When I was an A.M.O. at Frimley Sanatorium many years ago we used to make fairly accurate prognoses from the differential counts. The *Mycobacterium tuberculosis* is probably one of man's oldest parasites, hence its chronicity; the fact that variants of it are found in many other vertebrates suggests that it may have preyed on man's prehuman ancestors. It is generally undefeated: even from fibrous nodules from healthy lungs the *M. tuberculosis* can be grown. I do not suppose that there is anything specific in its modifying leukæmia; it is simply a very old enemy which stimulates the white cells to function.

(C) There seems to be no record of the Mantoux state of leukæmic patients. It is possible that the decline in tuberculosis may in part be associated with the present increase of leukæmia: i.e. the almost universal drill-sergeant of the white army is often absent now.

(D) At the end of last century tuberculin, sometimes in massive doses, was used in the treatment of leukæmia.

'In some cases reduction of the leucocyte count occurred, but the course of the disease was not influenced. Certain cases reacted adversely' (Forkner, 1938).

Now we know that the leucocytic response to dead bacilli is different in quantity and quality from the response to live bacilli.

(E) Only in the last ten years or so, with effective anti-tuberculosis drugs at the ready, would one be justified if one injected avirulent tubercle bacilli such as BCG or the Vole bacillus into leukæmia patients in the hope of rousing the white cells to a mature response. It would have to be done carefully, gradually and persistently, starting with a few thousand twice a day.

I wrote two articles on this subject; nobody took the slightest notice. The second one ended with: 'Will no one dying of leukæmia clutch at this straw?' The straw still floats unclutched. Yet the argument is logical, based on pathology and elaborated in the light of function, the surest light of all. Nobody's opinion is worth even a derisive hoot until it is tested. G.P.s cannot test it; it is a job for a specialized hospital.

This natural history view that leukæmia must be beaten by raising the body's defences gets enormous support from Sutherland (1960), who provides whole blocks of evidence showing that the body's resistance to malignancy is shown by lymphatic infiltration of the tumour, the follicular hyperplasia and sinus histiocytosis of the regional lymph glands—all defence mechanisms. It is these activities that determine the length of survival after operation, even more so than the presence or absence of metastases. Here are a few sentences which show the wind of thought that blows through Sutherland's scholarly pages:—

'There is some evidence (Pelner, 1957a; Ungar, 1953) that cancer patients as a group have a disproportionately low incidence of infectious disease. This observation raises the possibility that their immunity responses have been less than averagely stimulated and that, as a consequence, their reticulo-endothelial system reacts ineffectively to the challenge of cancer. Stern (1941) investigated the reticulo-endothelial function of cancer patients and estimated it was reduced in 86 per cent. of patients' (p. 79).

Of breast cancer: 'Regardless of the presence or absence of axillary metastases, the percentage of long-term survivors increases with increasing degree of sinus histiocytosis' (p. 134).

'A moderate or marked degree of one or other of the host reactions of lymphocytic infiltration or sinus histiocytosis is present in nine out of every ten stomach cancer patients who survive 5 years or more' (p. 135).

So far as leukæmia is concerned most modern treatments aim at destroying the white cells or their source, the almost functionless, immature white cells. The suggestion here is that, as occasionally happens in natural conditions, an attempt should be made to train them, to coax them back to their duty.

A BIT ABOUT HISTORY-TAKING

A series of good histories of patients who develop malignant disease, especially those who do so fairly early in life, might bring out the point about previous infections. The barrister type of cross-examination—'Have you had measles, mumps, meningitis?'; 'Yes, yes, no'—gives a caricature of a history. An experienced G.P. takes his history in snatches, at every

visit. Gradually he alerts his patient's mind to past illnesses, which that mind has very properly and protectively forgotten. Later he will confirm his findings by side questions: 'What was the school san. like?'. 'That wound you got in the war, did it discharge? How long were you in hospital with it?' Nor will he forget the minor invasions which also stimulate the reticulo-endothelial system: 'I see you have a lot of scars from acne on your back. Did that worry you much? For years?'. On later visits he will revert to these old forgotten fights and sometimes he will get new material or a completely different story, showing that his early findings lack validity. There are some patients one cannot get a good history from and one has to get it from relatives. A really reliable history may take three months to get in weekly visits.

The G.P. will remember, too, that some occupations involve bleeding or bruising almost daily—farm labourers, quarrymen, woodmen. They and others are also liable to assaults from nettles, thistles, hawthorn and blackthorn, all of which stimulate the reticulo-endothelial system. A hundred years ago few escaped the daily stimulant of bites from fleas, lice or bugs, but now only mosquitoes and midges help us to keep up our resistance. Never in the whole history of the Hominoidea has there been anything quite so unprepared for battle as the modern city gent! Those who deplore the barbarism of boxing should remember that the autohæmotherapy of the bruise and the occasional bleed may give rise to habits and resistances that ward off a gastric carcinoma forty years on.

When finally our G.P., after much cogitation and rumination and picking over of evidence and words, does produce his history it should be like an Old Master and worthy to be stored in some central place: his little bit in the mosaic of causation.

THE RHEUMATISMS

A large part of the G.P.'s work is concerned with complaints which are loosely labelled 'rheumatic'. He has to have some workable theory about them and one of the most satisfactory is the Theory of ORP. It may be stated thus.

It is well known that a cell has a higher density than the waves that wash its walls. This entails an Osmosis-Resistant Power (ORP); it probably depends on chemical and physical qualities within the cell and is part of the sovereignty of the cell. Possibly each cell has a minutely different ORP: probably groups of cells do. One would guess that the cells on the outer sides of tissues and of connective tissue have a greater ORP than those within. When this power is lessened more water must be drawn into the cell. In fibrous connective tissue, cells which are less expandable than muscle cells, this will give rise to intracellular tension and, with a few hundred thousand of them involved, to pain. The causes of losing ORP, hereafter called LORP, are: (1) a change in the usual rhythm of function: e.g. when

the neck is held stiff in a 200-mile drive; (2) when the cells are suddenly called upon to over-function as in the first game of rugger in the season or mowing the lawn for the first time; (3) when function is lessened by the part being deprived of full circulation by cold and immobility. These may be called the physiological LORP's. Then there are the toxæmias which probably act by paralysing the nerve-endings to cells. The aching at the onset of influenza and other invasions is a common example of LORP. The first somatic symptom—not the first symptom which is, of course, a mental one—of reactivity in tuberculosis is commonly an aching round the knees. Experts deride the suggestion that rheumatisms come from septic sources, but in its trivial manifestations the examples are legion. They are hardly doctor-worthy and you are more likely to hear about them in the 'local' or where women swap symptoms for their comfort. The costiveness that always brings on the 'screws', the cold that is always followed by pain in 'my old shoulder', the old molar that flares up now and then and makes 'my old wound ache'.

By the time cases of LORP get to the specialist whole layers of connective tissue, generally around the joints, are affected; a host of lymphocytes have moved in to try and clear up the mess, the position in some localities has become irreversible, and to remove the septic source may well be not only to lock the proverbial stable door, but also to stimulate the errant nag to commit further nuisances. It is this that has brought the idea of sepsis as an initiator of LORP disease, quite illogically, into the quiver of professional scoffers.

There is another angle from which to look at these LORP diseases. An average man contains about 35 litres of water: 43 per cent. in cells, and 8 per cent. in blood, whilst 49 per cent. bathes the tissues—two oceans and an inland sea with tidal connexions. As with all tidal mechanisms there are contradictions. The higher the specific gravity of the extracellular fluids the less temptation is there for the cells to lose ORP and the giving of large doses of sodium chloride and other salts is logical.

A fine old doctor in the Scilly Isles, Dr. Addison, had a noted cure for lumbago *et al.* which on one occasion at any rate brought fishermen from an outlying island in a storm at night to get a bottle of 'the soapy medicine'. It was a saturated solution of potassium citrate (10 in 6), a teaspoonful four-hourly.

A remarkable case in a Norfolk village some thirty years ago sticks in the mind.

An elderly woman with rheumatoid arthritis in a cottage, bed-ridden, almost fixed and in pain. She did not like one to come too near her bed lest one jolted it. She had had one kidney removed for stone and during my locum tenency the one ureter became blocked by a stone. She passed no urine for five days, but during that time she lost her pain and sat up and used her limbs. She became less apprehensive, almost cheerful. I gathered that the same sequence of events had occurred before and was repeated after I had left. With the passing of the stone all her old symptoms returned. Obviously what had happened was that the extra-cellular fluid had got to such a high density that reverse osmosis took place—from the swollen cells.

On the other hand, copious drinking of water, spa treatment, does good, probably by eliminating toxins, though one would think that osmosis through the cell wall into the cell was made easier. The primary point is that a functioning cell and a functioning mass of cells must have ORP, and all the tricks in the physiotherapist's bag and all the desires in the cripple's mind for movement are for that end. A controlled trial in which increased salinities and dehydration alternated with water saturation, both accompanied by efforts to restore function by movements would be logical and in accord with tidal traditions. The whole subject is vastly expandable—Orpology in six volumes, Professors of ORP, LORP hospitals. In any case it is a good working hypothesis for the G.P. Whether it would stand up to the criticisms of the biochemist and histologist and whether their views would stand up to the eating of the cake—the results of clinical experience and the verdicts of patients—are other matters.

CARDIOVASCULAR DISEASE

The average G.P. does not treat the heart with quite the same pampering reverence as the cardiologist. He is inclined to take a more holistic view: to look on the heart as being *primus inter pares*, geared to a superb musculature, thousands of little muscles, two-hundred-odd sizable ones, all capable of speeding the circulation at all but very few stages of the circulation. He may remember the first and last figures for cardiac output in trained males from Winton and Bayliss' 'Human Physiology' (1955):—

Work performed (kg.-metres per minute)	Oxygen consumption (litres per minute)	Pulse rate (per minute)	Cardiac output (litres per minute)	Output per beat (ml.)
0	0.25	70	4.2	60
1,680	3.94	179	37.3	208

Between these two comes every form of physical exercise, and the muscular pump is the bigger part of this essential mechanism. People neglect the heart's bigger brothers at their peril. The brain demands over a litre of blood each minute and does little to assist its passage, so a sedentary worker is using the heart pump only. Yet it is a universal experience to find how pleasantly the mind works while walking. Coronary artery disease is one of atrophy, of neglect of this marvellous mechanism, of the arteries of the heart becoming crusted because they have not been regularly stretched, of somatic muscles being a resistance rather than an enormous help. My experience is that cerebral thromboses do not come to those who are in regular exercise. Just as in the old days—the problem is different now—the best advice to give to the healed patient with tuberculosis was to live a life of spartan hardness, so anyone with a cardiac lesion, yes, even an old person if life and a feeling of well-being mean more than comfort to him or her, should be advised to get his other muscles into training, gradually, cautiously and cunningly, *and keep them there*. A series of careful

histories of the physical exercise undertaken, daily and at weekends, by patients with coronary disease during the preceding five years would in my view indubitably bring out these points.

INFECTIOUS DISEASES

Some forty years ago it was my privilege to work for a splendid doctor of the old school, Dr. E. Stork, of Bury St. Edmunds, who kept a board in his surgery on which the names of the infectious diseases were written vertically and horizontally with lines drawn under them, making squares, as in tournaments. When he got two diseases occurring together in the same patient, or following one another, he pricked the appropriate square. Some squares were pricked all over, the measles-pertussis square, for instance; some squares were empty. Nowadays, when we know more about viruses, and particularly that one virus may interfere with another, stop its colonization or modify it, the tournament method of recording might reveal information of importance, especially if a number of G.P.s sent their cards up after a few years to some central body. Why do about 40 per cent. of the population get infected with the virus of mumps without having any symptoms? Does that depend on their having had some other virus disease like measles?

Some time ago I came across a grandmother who got a bad attack of measles from her grandson. She had been at a boarding-school in epidemics of measles and had knocked about the world, and it seemed highly improbable that she had not been infected before. The only unusual fact from the history was that she had nearly died from diphtheria at the age of three and had suffered from cholecystitis from childhood to the age of 23 when her gall-bladder was removed.

These facts would be of significance only if other doctors reported the same sequence. The virus infections present great opportunities for Sherlock Holmesing in general practice: e.g. a reiterated sentence from the daughter of an 85-year-old man:—

'Father never catches a cold from me, but if any of the children come near him with a cold, he always catches it from them—and badly'.

Does herpes simplex, which is a life-long infection, protect against anything?

PSYCHOLOGY

It is said of the Brownings that they always got God into the last lines of their poems. Similarly, the psychological aspect of the matter—and there are few subjects in the world that have not a psychological aspect—is generally dealt with last in medical articles. Perhaps psychology is rather a pretentious word for the game played continuously by us G.P.s in our dealing with patients, relatives and others—'Spotting the Motive'. 'What is this fellow wanting me to believe?'. 'Is this woman talking to convey information, or for her own comfort or——?'. 'This chap is too stable to be natural. Why?'. Eventually we all get the noses of hounds for the self-

boosting bravado story, indicating some need for self-stimulation, the belittling of symptoms by strong silent men and women with tight lips, the child's sudden silence which covers a complex fear, compounded of smell, taste and other sensory thoughts, and therefore unverbalizable; the picked words like a palisade round something shameful; the uninhibited talking like a bird singing for the pleasure of the thing and as a challenge to the world; the regression in the minds of men and women back along the path of their development in some illnesses and toxæmias; the almost functional regression in adolescents from time to time to childhood, which reminds one of schizophrenia; the apathy to the passing scene in the seriously ill and dying.

In the country we watch the community reactions of what is after all a gregarious animal: the village roused from a dull unwillingness by a few stalwarts to a sub-manic state at the Flower Show; the meanness of those with full barns—i.e. with something to be mean about; the gossips like cannibals passing round bits of somebody's liver for their own exaltation and a gloat; the need for sadism in dealing with insect pests and juvenile delinquents; the necessity for masochism in filling out one's own Income Tax forms and in obeying stiff-collared conventions; the Church party who accept disease with dignity as an act of God; the Nonconformist party who are inclined to rebel against it to their ultimate advantage; the 'Red Lion' lot who generally abstract some humour from it with ribald jest, and do best of all; the erotism of Spring, the expansiveness of summer, the storing acquisitiveness of autumn, the happy, entrenched withdrawal of winter, so different from the depressions which in our view always mean endocrinal failure. All this is our daily bread and, although it would seem to have little to do with research, it gives a glimpse into the minds from which much hopeful research might spring: minds dominated by the function motif.

CONCLUSIONS

When I was a boy, another boy and I found a red-backed shrike's nest, the eggs in which had the spots round the unorthodox or pointed end. We took one and in the holidays bore it in triumph to the Natural History Museum. The Oologist, a tall man with thick-glassed spectacles, looked at it, handed it back to us, and beckoned us to follow him. We went down various passages and came to a small room with cabinets all round. Without hesitation he pulled out one drawer of a cabinet. It contained many clutches of butcher bird's eggs, all with the same abnormality as ours. The only words he said to us were: 'Can you find your way back?'

It was disappointing that our find was not a great rarity, but the incident was profoundly satisfying. Here was Demonstrated Authority.

We G.P.s need some such central authority of our own, some place where we can bring or send our ideas and notions, where some kindly librarian like those whom I have been lucky enough to find at my old teaching hospital will say: 'Yes, a very good idea, but I think you will find that Professor Smith and Sir John Brown and Dr. Robinson had very

much the same line of thought—here—and here—and here'. But when on the rare occasions we do get a notion that appears to be original we want some institution which will act as a liaison officer and pass it on and get it tested. We do not hanker for specialists' opinions based on the same facts that are available to us. We feel that our opinions, the resultants of long cogitation on country rounds and hours of cottage talk, may be in greater depth than theirs. Besides, we unworthily suspect that they get peevish because they have not thought of it first; the impertinence of a new angle of approach. We also want somewhere where we can store our observations and experiences, so trivial in themselves, so valuable when confirmed by many others.

Perhaps the College of General Practitioners will fulfil these functions.

References

Fraser, T. R. (1894): *Brit. med. J.*, **i**, 1172.
Forkner, C. E. (1938): 'Leukemia and Allied Disorders', New York, p. 240.
Sturgis, C. C. (1955): 'Hematology', 2nd ed., Springfield, Illinois, p. 791.
Sutherland, R. (1960): 'Cancer: the Significance of Delay', London.
Winton, F. R., and Bayliss, L. E. (1955): 'Human Physiology', 4th ed., London, p. 38.

THE TREATMENT OF SEASICKNESS

By B. M. JENSEN, L.M.S.S.A.
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For the effective treatment of seasickness medication other than oral is necessary. In practice this means the intramuscular route, and in my experience promethazine hydrochloride is the drug of choice. This is given in a dose of 50 mg. in 2 ml. intramuscularly either in the gluteus or the arm. Needless to say, the arm is usually the more convenient but sometimes there is an excessive local reaction in the form of swelling and slight pain on injection. The other side-effect is considerable drowsiness, much more than normally associated with antihistamines. This may last the best part of the day. After injection the patient is instructed to lie down in the cabin for twenty minutes and then to get about. This is usually achieved easily, the improvement or cure of the patient's condition being dramatic even in the heaviest North Atlantic weather.

The effects of 50 mg. usually last for two days, seldom less. In some cases the dose may need to be repeated in several hours or on the next day but this is rare and in over 5000 injections only two absolute failures have been recorded. No dietetic restrictions are necessary and meals can be taken and retained soon after injection. Fruit is the only food that

should be dispensed with. Sugars should be given in profusion, barley sugar especially, to those who are at first afraid to eat.

This treatment would appear to be far more effective than anything yet attempted and patients can be assured that their troubles will soon be over after their injections.

I have to thank Dr. C. M. Morton, Medical Superintendent, Canadian Pacific Steamships, for permission to publish this report, and Miss V. Cresswell for her help in its preparation.

EUSOL

By W. R. WILSON, M.B., B.Ch.
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To those of us who were engaged in the 1914-18 war, Edinburgh University Solution, popularly known as eusol and still retained in the ***British Pharmacopœia Codex*** as solution of chlorinated lime and boric acid, was our great standby as an antiseptic. It consists of equal parts (1.25 g.) of chlorinated lime and boric acid powder, made up to 100 ml. with water, and the standard laid down for it is that the content of available chlorine shall be not less than 0.25 per cent. w/v.

Whilst many would agree that eusol still merits a place in our armamentarium, its instability has largely resulted in its falling into disuse. A simple method of overcoming this instability is to mix the chlorinated lime and boric acid immediately before use—and not before.

A standardized suspension of chlorinated lime (3 g. of chlorinated lime to 8 fluid ounces [230 ml.] of water) may be stored indefinitely, and mixed with an equal weight or more of boric acid crystals and an equal volume of water or 5 to 10 per cent. saline solution—which should be no more than lukewarm—when required. The mixture is shaken, and after a minute or two, when the precipitate has settled, the separated solution is poured off.

For use it is diluted with an equal, or double, quantity of water.

It is the instability of eusol which makes it comparatively harmless to the tissues. In my experience, its efficacy and mildness are further increased and exudation encouraged if saline rather than water be used. Three factors are associated in its 'kindness' to the tissues: the brevity of its activity ***in situ***, its volatility and its hypertonicity. One warning is necessary, and that is that eusol is definitely injurious to plated and ordinary steel instruments.

The usual method of applying it is on boric lint. The official recommendation is that this should not be covered by a protective dressing but in my experience the saturated lint should be covered with some waterproof material—'to keep the steam in', as I tell the patient. It is also said nowadays that it should not be used for irrigating wounds, in view of the irritation it may cause to the tissues. This again, is quite contrary to my experience, especially if the saline solution is used. It should not, of course, be used for wounds of the eyes, as here it is much too irritating.

GENERAL PRACTITIONER CLINICAL TRIALS

AN ORAL DIURETIC

DISULPHAMIDE ('disamide') is a synthetic oral diuretic drug which pharmacologically occupies an intermediate position between chlorothiazide and acetazolamide. Its main advantage is the small dosage schedule required, since it is claimed that sufficient diuresis may be maintained with one to two tablets (200 to 400 mg.) on alternate days. It is also claimed that there is no need to use potassium supplementation with this drug. This might be of particular advantage in general practice, when the more simple the dosage schedule, the more likely is the patient to adhere to it.

SCOPE OF INVESTIGATION

It was decided to test the effectiveness of disulphamide in the relief of œdema due to any cause, such as heart failure, the nephrotic syndrome, varicose veins, arthritis. It was also decided to test its effectiveness in four other conditions, in which fluid retention may play a part, or in which an oral diuretic may be indicated: toxæmia of pregnancy, the premenstrual syndrome, hypertension and obesity. Six general practitioners took part in this trial, which was divided into two parts, the first being a short-term evaluation over four weeks, in œdema and toxæmia of pregnancy, and the second part being a longer-term evaluation over a period of three months in the premenstrual syndrome, hypertension and obesity. A total of 78 patients was studied, 46 being included in the short-term evaluation and 32 in the longer-term evaluation.

RESULTS

Œdema.—A total of 43 patients was treated, there being a slight preponderance of women over men, with the maximum incidence in the 61-80 years age-group. In the majority of cases the œdema was due to cardiac failure. Half of them had previously been treated with other diuretics, and the other half had not previously been treated. Of the other diuretics previously used, chlorothiazide or hydrochlorothiazide had been the most commonly employed, and all the previous treatments had resulted in a complete relief of œdema in 50 per cent. of patients, partial relief in 25 per cent., and no relief in 25 per cent. The effect of disulphamide was assessed by the degree of œdema present during the period of the trial, which was recorded as: $++$ = severe, $+$ = moderate, $\pm$ = slight, $-$ = none.

As table I shows, some patients were already œdema free, or with minimal œdema, as a result of previous treatment with other diuretics. In these cases, the effectiveness of disulphamide was gauged by its ability to keep them œdema free, or prevent the œdema becoming worse. The total number of

patients treated in each week declined during the trial due to patients omitting disulphamide treatment, either because of side-effects or because of lack of effect compared with their previous treatments. As the trial proceeded, there was an improvement both in the degree of œdema, and also in complete disappearance of œdema. The figures obtained with disulphamide in the fourth week of the trial are seen to compare favourably

	Degree of œdema				Total cases	No. with no improvement
	++	+	±	—		
Initial	23 (54%)	13	3	4 (9%)	43	—
1st week	10 (24%)	19	2	11 (26%)	42	14 (33%)
2nd week	4 (11%)	14	–	19 (51%)	37	6 (16%)
4th week	2 (8%)	5	1	18 (69%)	26	3 (12%)

TABLE I.—Results obtained with disulphamide in 43 patients with œdema.

with the results recorded with previous diuretic drugs. Hypertension was present in nine patients, and in seven of these there was a small fall in diastolic pressure of 5 to 10 mm. Hg. Albuminuria was present in five of these patients and this was reduced in amount in three during the trial.

Toxæmia of pregnancy.—Only three patients were treated, as most of the participating doctors felt that the use of oral diuretics in this condition has not been confirmed. There was a progressive improvement in œdema in all three, and also disappearance of albuminuria in the one patient in whom this was present. Of the two patients with raised blood pressure, one sustained falls of 20 mm. Hg systolic and 30 mm. Hg diastolic, at the end of the four-week period, but in the other patient blood pressure continued to rise. No conclusions could be drawn from these three cases.

Premenstrual syndrome.—Only five patients with this condition were treated, since the results did not appear to justify continuing with this part of the trial. It did not appear that disulphamide had any appreciable effect in these patients over the three monthly periods of the trial, and better results had been obtained with other previous treatments.

Hypertension.—Eleven hypertensive patients were treated with disulphamide, the initial systolic pressures being between 190 and 230 mm. Hg, and the initial diastolic pressures between 115 and 150 mm. Hg. Six of them were already under treatment with other hypotensive drugs, and yet their blood-pressure levels were still high. Table II shows the falls in blood pressure obtained in the three monthly periods of the trial: in this small series of cases, disulphamide alone was of no practical use as a hypotensive drug. Four of these patients were overweight at the beginning of the trial, and all four sustained satisfactory weight losses at the end of the third month, of 6 to 25 pounds (2.5 to 11 kg.). This was presumably due to fluid loss, but it did not appear to be accompanied by a fall in blood pressure.

Obesity.—Obesity was only treated by three of the participating doctors, and 16 cases were studied. In two London suburban practices, the patients

were suffering from a slight to moderate degree of obesity, and no weight losses at all were recorded in the three months of the trial. On the other hand, in the remaining practice in a northern town, much heavier patients were treated and average monthly weight losses of 7 to 8 pounds (3.2 to 3.6 kg.) were recorded in all three periods of the trial. It was concluded that fluid retention probably played a part in these latter cases but that,

	mm. Hg below initial reading							No. of cases
	Systolic				Diastolic			
	10	20	30	Nil	10	20	Nil	
1st month	2	1	1	7	2	1	8	11
2nd month	3	1	2	4	4	–	6	10
3rd month	4	1	–	3	1	–	7	8

TABLE II.—Results obtained with disulphamide in 11 patients with hypertension.

generally speaking, disulphamide could not be advocated for the treatment of obesity.

SIDE-EFFECTS

The percentage of patients (66 per cent.) experiencing no side-effects at all was the same in the two parts of the trial, but the number of patients who had to omit treatment because of side-effects, rose from 9 per cent. in the first part of the trial, to 19 per cent. in the second part of the trial. It is apparent therefore that, when disulphamide is given over a fairly long period, a fifth of the patients will probably be unable to continue treatment on this account. Paræsthesia, gastric pain, headache and drowsiness were the commonest side-effects encountered and it was concluded that disulphamide is not as well tolerated as other oral diuretic drugs in this respect.

CONCLUSIONS

We concluded that disulphamide is an efficient oral diuretic for the treatment of œdema, which can be given by a convenient small-dosage regime. These advantages, however, are vitiated by the fact that the incidence of side-effects in this trial was comparatively high, and we felt that on this account we would not prefer disulphamide to other diuretic drugs. It was also concluded that disulphamide alone has no hypotensive action, although we did not investigate the effect of combining disulphamide with a hypotensive drug. Our results would also appear to suggest that the use of a diuretic such as disulphamide is not indicated in the treatment of obesity, unless there is also evidence of fluid retention.

The following doctors took part in this investigation:—
Dr. D. H. Clarke, Streatham, London, S.W.16
Dr. J. H. Davidson, Dulwich Village, London, S.E.21
Dr. T. P. McB. Kelly, Coleraine, N. Ireland
Dr. D. A. Levin, Liverpool 18
Dr. B. R. Middleton, Great Wyrley, Walsall, Staffordshire
Dr. D. Wheatley, Twickenham, Middlesex
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SECTION OF GENERAL PRACTICE OF THE
ROYAL SOCIETY OF MEDICINE

COOPERATION BETWEEN THE HOSPITAL SERVICE AND GENERAL PRACTITIONERS

By SIR GEORGE SCHUSTER, K.C.S.I., K.C.M.G., C.B.E., *M.C.*
Chairman, Oxford Regional Hospital Board

May 17, 1961

ALTHOUGH my subject is cooperation between the hospital service and general practitioners, this must be seen as part of the threefold cooperation between the three arms of the Health Service: the hospitals, general practitioners and local health authorities. To improve this cooperation is the top priority task which lies before us, in what we can regard as the second chapter in the story of the National Health Service. There are, of course, other important tasks and opportunities today, especially in improvement of hospital buildings and equipment but these mean nothing without the work of the human beings who have to conduct the service, and therefore I put cooperation as the most important task of all.

OBJECTS OF COOPERATION

The first object is to ensure the best possible results from the available national resources by keeping to a minimum the demand on hospital beds and making the maximum possible use of domiciliary treatment, combined with the fullest use of the services of general practitioners in many ways. The second object is to preserve opportunities for a career of maximum scope and interest for general practitioners.

To state the main objects in this crude way may seem to reveal an outlook which treats the interests of the patients as of secondary importance. That is definitely not my outlook. Starting with the first objective, which is essentially to make the best economic use of available resources, this is not an ignoble purpose and certainly affects the interests of the patients. Making the best use of available resources means not only of material resources expressed in terms of money, but also the available supply of human skill. Material resources are important because there is a limit to what the country can afford to devote to social welfare purposes, and the Health Service is not the only one of these. It is essential in the interests of the patients as well as of the general public that these resources should be used to the best

advantage. Diagnosis and treatment as a hospital patient are costly and complicated, and therefore should only be provided for those whose needs cannot be met in any other way. There is more to it than this, however, from the point of view of the patient. Hospital admission is at best a serious disturbance in life, and for this reason alone it should be kept to a minimum. This is particularly important in the case of children.

The second objective, though stated in terms of general practitioners' interests, is also essential in the interests of patients. The National Health Service has made the general practitioner, available to everyone, the main provider of medical care. It is vital that the career of general practitioner should be such as not only to attract the entry of men and women of the highest quality, but also to provide them with interest, incentive and inspiration to bring out their best qualities once they have entered. Unless the conditions of work for general practitioners are such as to provide job satisfaction in the truest sense, it will be impossible to have a fully satisfactory National Health Service. Can we regard present conditions as satisfactory? I speak with diffidence on this, but there appears to be general agreement that since the coming of the National Health Service there has been a tendency for general practitioners to become separated from the hospitals. There are many reasons for this, such as the increasing complexity of medicine, with the consequent difficulty for the practitioner of keeping in touch with the technicalities of hospital practice, and the changes in the financial relations between the consultant and the family doctor. As Lord Taylor has put it, there is a need to guard against the danger 'that the G.P. may become a relatively unimportant outpost in the Hospital Service'.

What then can be done to further what I have stated as the two main objects? And here it must be noted that, although I have made a distinction between them, they are in practice closely interconnected. The more we can make use of the services of general practitioners to reduce the burden for, and increase the efficiency of, our hospitals the greater will be the opportunities offered to them to make the most of their talents and to get satisfaction from their work.

WHAT THE HOSPITAL CAN DO

There are three main functions for general practitioners in regard to which they need help from the hospital side.

The first of these is to ensure that entry into costly hospital beds is restricted to those who really need them. Here general practitioners are the front line of defence. It is they who are primarily responsible for the process of selection. Selection depends upon diagnosis and therefore we on the hospital side must make our resources available to help them in this.

The second main way of reducing the demand on inpatient hospital services is to reduce the length of stay. Here again the practitioner can play a vital part. The more competent he is the more confident can hospitals be in discharging patients from hospital to home care. This subject, of course,

has many implications. Practitioners today may feel that the hospitals and consultants are to blame for holding on to patients too long and taking to themselves a share in after-care which might well be undertaken by family doctors. Then, too, it must be recognized that the justification for early discharge depends not only on general practitioner services but on the standard of home-care facilities provided by the local health authorities.

The third important possibility for valuable help from practitioners could be in helping to meet one of the great needs of the hospitals: the need for experienced and reliable medical help at a level between the house officer and the consultant. This need is felt particularly in the casualty department, and possibly in some of the smaller specialties such as dermatology. The continuous service of an experienced general practitioner could be much more helpful than the periodically changing service of a younger doctor. One of the key questions for consideration is how far and by what means opportunities for making use within the hospitals of the services of suitably qualified general practitioners can be developed. This question points to many issues and proposals dealt with in the report of the Platt Working Party.

ACCESS TO HOSPITAL DEPARTMENTS

For helping practitioners in their preliminary task of selection based on diagnosis, it is obviously important to consider giving them access to hospital departments such as those of pathology, radiography, electrocardiography, and physiotherapy. So far as our Region is concerned, we fully recognize that x-ray and pathology departments should be open for direct service to general practitioners. In the case of physical medicine, although there is often a request that this department should also be open, I find that the view of my own advisers, based on their experience, is that this department probably functions better by having all patients referred to a consultant in physical medicine who can make the best use of the facilities of the department, particularly under the existing conditions of a shortage of physiotherapists. This question of access to hospital departments is the sort of question on which the hospital service needs to take account of the balanced views of general practitioners and on which operational research of the kind to which I shall refer later would be valuable.

There are several other closely connected questions to which our experience points. For example, we are asking ourselves in our Region whether, taking account of the decline in tuberculosis, the mobile mass radiography unit has now become too costly to justify its continuation. Might a 100 mm. 'rural survey' unit provide what is required? If so, could the money spent on the mobile mass radiography unit be better spent by providing a mobile pathology unit?

DIAGNOSTIC CENTRES

In the Oxford Region we have had three of these working for some years (at Corby, Rushden and Wolverton), and we have just opened a new one at Bletchley. We feel that it is important to attempt an assessment of their

function and value. For this we need the active cooperation of the practitioners who use them. Here again is a case in which a cooperative project of operational research would be of value. Another question for examination is whether diagnostic centres and hospital outpatient departments could usefully absorb the local authority clinics; e.g. antenatal, maternity and child-welfare.

DECENTRALIZED SERVICES OUTSIDE HOSPITALS

Consideration of the use of diagnostic centres points to a wider question of what can be done to provide decentralized services which will help to meet the needs and convenience of local communities, if the Ministry's policy of concentration of services into 'district general hospitals' is fully implemented. I believe that there is a number of ways in which general practitioners could make valuable contributions, and that the time has come to initiate a few carefully planned experiments in cooperation.

One form of experiment, suggested to me by my own board's medical staff, is based on the idea that a group of general practitioners (say, four to six), one at least of whom should be on the staff of the neighbouring district general hospital, should combine to build a general practice surgery on an interest-free loan from the Ministry, and then get the local health authority to participate by allocating a health visitor, a home nurse, and a midwife, to be based on their surgery and serve the group. The population served (about 10,000 to 15,000) would provide an adequate volume of work to support such a combined effort. There would be 150 to 200 births a year, in connexion with which antenatal care would be needed; there would be the normal incidence of ordinary illness; there might be 2,500 children of school age or less needing various forms of minor treatment or periodic examination; and their parents would need advice on health problems. Such a group of general practitioners, serving a population of 10,000 to 15,000, working as a team, with one or two of their members having regular contacts with a neighbouring hospital and collaborating closely with local health authority workers, could fulfil most valuable functions which ought to be backed in every possible way by the hospital authorities. One possible function of great value would be to carry part of the load which now falls on the casualty departments of hospitals: e.g. treatment of 'casuals' as distinct from accident cases, treatment of minor accidents, dressings. This is important because the policy (which I am sure is right) of concentrating hospital casualty departments into fully equipped, 24-hour service district general hospitals will create a need for supplementary decentralized services for the convenience of local communities.

If the local health authority were prepared to pay a rent for the accommodation of their staff, it ought to be possible to find ways of financing extensions of the building necessary to accommodate them. Additional capital, if needed, might be found in other ways, at least for one or two pioneer experiments.

DOMICILIARY CONSULTATIONS

The provision for these was looked to as likely to provide one of the greatest benefits for the whole National Health Service, but there have been charges recently that this facility was being widely abused. According to the experience in my region, these charges are misleading and unfair. Although I dispute the wide abuse of this facility, there does seem to be evidence of considerable variation in the way in which advantage is taken of it, and it would be of value to carry out a fairly comprehensive survey of how it is being used over the country as a whole. This points once more to what might be a most useful operational research study: to show how the practice of domiciliary consultations is being used, what effect it is having on admissions to hospitals, what effect it might, if extended, have on improving the possibility of earlier discharge from hospitals, and whether it could usefully be extended in other ways: for example by enabling the health visitor and the hospital almoner to consult in the patient's home on such matters as the best care for geriatric patients, and arrangements for a patient's admission.

THE GENERAL PRACTITIONER WITHIN THE HOSPITAL

General practitioner beds.—Two things seem to me to be clearly right: that there should be a generous provision of general practitioner maternity beds and that an adequate number of smaller hospitals served mainly by general practitioners should be retained in rural areas. In the Oxford region we have the lowest maternal mortality rate of any region and also what is, I believe, the highest proportion of general practitioner maternity beds. Our forward planning proposals provide for 360 general practitioner maternity beds as compared with 490 beds in specialist units. Our plans also provide for 329 general practitioner acute and convalescent beds and 729 general practitioner long-stay beds in smaller rural area hospitals.

The question whether a proportion of general practitioner beds should be provided in the main specialist hospitals is another matter. From a practical point of view it is clear that such beds could only be of use for family doctors practising within a reasonably short distance of the hospital. Apart from this, there is a number of considerations both for and against the idea. In our region we are contemplating the possibility of making an experiment with a general practitioner ward in one of our main general hospitals, and we have noted that the Platt Working Party in paragraph 139 of its Report has said: 'We favour the continuation of experiments in the provision of general practitioner wards in general hospitals'. Here again is another subject for operational research. We need to have more accurate knowledge as to what could be the results in terms of economy and service to patients of having general practitioner wards in the main general hospitals.

Hospital appointments for general practitioners.—Apart from the provision of general practitioner beds, there are, of course, other important ways of bringing in practitioners to help in the work of our main hospitals. The

relevant recommendations of the Platt Working Party Report include not only the increased employment of general practitioners as clinical assistants at special clinics but also their proposal for the creation of a new grade of 'medical assistants' and for the extensive employment of suitably experienced general practitioners in part-time hospital appointments in this grade. We on the hospital side are anxiously waiting to learn what are the considered reactions of general practitioners to these proposals, and in particular to the proposal for the employment of practitioners in hospital staffing in the 'medical assistant' grade. When one takes into account, as noted in the Platt report, the 'extent to which the hospital service today is dependent upon young doctors from overseas whose stay here is temporary and the uncertainty whether this help will continue to be available on the present scale', one must agree with its statement that everything possible should be done by the hospitals to take advantage 'of the real help which we believe is obtainable from general practitioners'.

COMMUNICATIONS

There is one more matter which I must mention when considering what can be done on the hospital side, and that is the matter of communications—communications from general practitioner to hospital, from hospital to general practitioner, from hospital to patient, and from hospital to relations. One of the greatest needs at present is to improve the working of communications on these lines. Here is yet another subject on which an operational research study would be of value. It would be valuable, for example, to investigate the basic requirements of the two sides (hospitals and general practice) so as to ensure the exchange of essential information in the most useful form and to reduce duplication in their separate records.

WHAT THE GENERAL PRACTITIONER CAN DO

I turn now to consider a few matters on which the influence of, and action by, general practitioners could be of special value.

Influence on public opinion.—General practitioners are in a position to exercise a great influence on the general attitude of the public to our welfare services. Clearly if the State is to provide facilities for meeting the material needs of all its people, this could lead to demoralization of individuals and serious national financial difficulties unless the people themselves are ready to appreciate the significance of what is being done and to avoid abuse of the facilities. So far as concerns the facilities provided by the Health Service, general practitioners can do, and indeed on the whole have done, much to help in influencing public opinion so as to avoid abuse.

Preventive medicine.—Another important field in which an enormously valuable contribution could be made by general practitioners is in the development of preventive medicine.

Operational research.—When considering the whole working of the National Health Service I am impressed by two things. The first is the requirement for more knowledge concerning the relative importance of

different kinds of needs and also the way in which our actual arrangements are working out, so that we may plan to use our limited resources most effectively. Secondly, I am always impressed with the great value of the contribution which general practitioners could make by helping to record and deduce lessons from the vast volume of experience in dealing with all kinds of ailments which pass before them. I therefore see a great need for a wide effort in the field of operational research, and great opportunities for general practitioners to help. I recognize the immense practical difficulties on the general practitioner side; most of them are overwhelmed with coping with day-to-day demands. On the other hand, things are happening which show that it is not impossible to hope for active contributions.

There is, for instance, the interesting pilot effort in operational research recently carried out by the Thames Valley Faculty of the College of General Practitioners based on the collaboration of a group of 30 family doctors practising in the counties of Berkshire, Buckinghamshire and Oxfordshire. This study aimed at providing an indication of the over-all general practitioner referral rate to hospitals so as to get an idea both as to the total number of such referrals and the nature of the various clinics involved. More specifically the objects were:—

(1) To determine the pattern of distribution of patients referred to various out-patient clinics.

(2) To find out the reasons for which patients were referred.

(3) To find out the number of patients referred to clinics because the general practitioner did not have access to hospital departments (e.g. x-ray, pathology).

(4) To find out what happened to patients after their first attendance as out-patients.

(5) To compare the referral rates of doctors in different types and sizes of practice.

(6) To assess the relative incidence of some of the commoner conditions referred to the various departments.

Although only intended to be a pilot survey, it has produced some interesting results and pointed the way to other valuable studies of this kind. It is a matter of great encouragement that hard-worked general practitioners should have found time to do the work involved.

This example of research work undertaken on the initiative of general practitioners, fits in very well with plans which we have had under consideration for some time in the Oxford region. We have worked out a programme for operational research to be carried out in collaboration with local authorities and general practitioners and we have been able to get a promise from the Nuffield Provincial Hospitals Trust to give us a grant for a building to house research workers at one of our main hospitals. In making our application for the grant we worked out a list of problems which we would like to investigate. The list is a formidable one. Broadly speaking, we want to know more about the way in which the whole Service is working, in terms of its effects on individual lives and their social setting. Only with this knowledge will it be possible to judge whether the available national resources of money and manpower are being used to the best advantage in terms of actual results on individuals, families and the whole social background.

THE SPIRIT OF COOPERATION

Training of doctors.—Clearly the attitude to, and understanding of the needs for, cooperation must be largely affected by the training which

doctors receive. If the general practitioner is to be a really key figure in the Health Service (as I believe he should be) we ought to plan and educate accordingly. One of the chief features of the Platt Working Party Report is its emphasis on the training facilities of the hospital service.

They want to 'encourage more to study longer in hospital before going into general practice'. They 'believe that the flexible arrangements proposed by them for the tenure of posts in the House and Registrar grades will help to provide a variety of experience which will be valuable to prospective general practitioners in their future work'. They recognize the administrative difficulties involved in this, but they think that these must be accepted 'in the interests of providing the best experience and training for a prospective general practitioner'.

There are, however, other views about training, as, for instance, that the general practitioner should take part in the training of medical students, since at present 'so little is done to prepare a student for family doctoring that he leaves hospital determined to avoid it'. This is clearly a field which demands a cooperative approach based on the experience of both hospitals and general practitioners.

Personal contacts.—Whatever opportunities there may be for cooperation, full advantage will not be taken of them unless on both sides there is a general spirit of cooperation, and, in order to create this, it is important to provide the human beings on each side with opportunities for human contacts with each other. Looking at the matter from the side of a regional board, the mere size of the problem makes it difficult to develop such contacts in a fully comprehensive way. In my own region, which on the basis of population and hospital beds is one of the two smallest in the country, we cover six counties and have to deal with nine different local health authorities. We have been asking ourselves for some time how we can get in touch with general practitioners throughout the region in a friendly and intimate way so that we can understand their outlook, desires and daily practical problems.

We made a small experiment a few months ago by inviting 12 representative general practitioners from all over the region to come to a dinner attended by our regional board officers and a few selected consultants. This produced an extremely interesting discussion and we hope to follow this up by other discussions.

Apart from special arrangements for meetings of this kind, there are certain existing institutions of which advantage can be taken and which I should like to see strengthened. I refer to the local medical and clinical societies, which provide opportunities for periodical discussion meetings between consultants and family doctors. There is an opportunity here for active help from the hospital side by providing accommodation which can be a sort of club centre in the main general hospitals, and by making grants for the equipment which may be needed for demonstrations, film demonstrations and the like. I feel sure that there is much to be done on these lines to improve personal contacts as a foundation for wide cooperation.

In addition, we have special arrangements which seem to be useful in some individual hospitals. One psychiatric hospital, for example, holds regular clinical meetings to which general practitioners are invited. Another

psychiatric hospital and our main orthopædic hospital hold monthly or weekly case conferences to which general practitioners are invited.

Executive councils.—The informal arrangements about which I have been speaking can be built up into valuable total effort. Informal and personal contacts of this kind will always be necessary, and no formal organizational arrangements can take their place. At the same time I still think it would be desirable to have opportunities for some more formalized discussions on policy. This brings me to the question of executive councils. These are the historical successors of the old insurance committees and, as such, they were not devised as policy-making bodies. Would it be possible to alter and extend the function of the executive councils? Or would an appropriate first step be to raise the status of their connected local medical committees?

SUMMING UP

We have to recognize that all the objects I have discussed have to be secured within the framework of a State service, financed by taxpayers' money and directed by a Government department under a Minister responsible to Parliament. We cannot escape the implications of this set up. They point to two overriding questions.

How can all that is best in the spirit of personal initiative and service be preserved in a State-directed undertaking?

How can the professional and clinical freedom of doctors and surgeons be reconciled with the just claims of public authorities?

I shall not attempt to provide any detailed answers to these two questions of fundamental importance. All that I want to urge is that the more effectively we can preserve the spirit of voluntary cooperation between the human individuals who are engaged in operating the three arms of the service the more surely will it be possible to provide satisfactory answers to my questions. I see this as a matter of paramount importance for our country today. I speak as one who is a profound believer in the contribution to be made by our country to human progress. I feel strongly that, in spite of the opinion which seems to be current, particularly on the other side of the Atlantic, that our importance as a world power is steadily diminishing, we still have something to offer in our British way of life which is better than that provided by many of our critics, and which can provide the best answer to ideas now prevalent in the Communist countries. I regard our National Health Service as an important exhibit in the shop window of the British way of life. It is unique. No other country has attempted anything of the same kind. It is distinctively British. It is of vital importance that we should make it a success and provide in our Health Service an example which will be the envy of the world.

It is easy to put forward these high-sounding general ideas but that is of little value unless we work out for ourselves practical steps which will ensure success. It has been the keynote of all that I have had to say that a deep and genuine spirit of cooperation between those who are working the three arms of the service is one of the most important conditions for success.

CURRENT THERAPEUTICS

CLXIII.—THE CHOICE OF ANÆSTHETIC IN DOMICILIARY MIDWIFERY

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It has been said that anæsthesia is one of the most dangerous complications of pregnancy and labour. Although the risk appears to be greater in hospital than in the patient's home, anæsthesia is a considerable undertaking for the practitioner who may be called upon to administer anæsthetics between one and ten times in a year, depending upon the size of his obstetric practice and the frequency with which he applies forceps (Parker, 1954). The choice of anæsthetic agent and technique for him is quite different from the choice open to the specialist or trained general practitioner anæsthetist. It is ether or chloroform, depending on the views of his seniors in practice from whom his training in anæsthesia has been obtained.

INDICATIONS

Today the indications for the practitioner giving anæsthetics in his obstetric practice are largely restricted to 'low forceps', the stitching of episiotomy wounds and tears, the management of unsuspected breech deliveries, and the removal of a retained placenta. Deep anæsthesia is required on none of these occasions, with the possible exception of the last, but his technique must satisfy the following requirements: safety for the mother, and minimal depression of uterine motility and the fœtal vital centres.

PREPARATION OF THE PATIENT

Safety in obstetric anæsthesia depends mainly upon the absence of vomiting during induction, maintenance and recovery from anæsthesia. It is not sufficiently appreciated that death may occur from aspiration of vomitus during the period between the cessation of administration of the anæsthetic and the patient becoming fully conscious. A sudden emesis by a fat woman lying flat on her back may be extremely difficult to cope with, especially if the bed is soft, and turning her on her side correspondingly more difficult and therefore more slowly executed. Complete starvation is not possible during labour, but prevention of vomiting may be attempted by a semi-fluid diet, which passes out of the stomach easily in as short a time as possible. Alternatively, the stomach contents on such a diet may be aspirated easily if desired as a safety measure, or vomited easily by the patient by her own efforts, the injection of apomorphine, or the administration of the anæsthetic. A low-residue diet, deficient in fats, but providing enough nutrition for a labour up to seventy-two hours should be aimed at. Salad,

fruit, cabbage and other high roughage foods are forbidden. Meat is allowable provided it is neither fatty nor fried. Barley water, squash drinks and tea may be given liberally. All that may be claimed for such a diet is that if a patient is maintained on it during the first stage of her labour it is unlikely that there will be a large volume of stomach contents at the end of the second stage in the majority of cases (Crawford, 1956a).

Vomiting is produced most commonly by a stormy induction of anæsthesia and it may be that the safety of the anæsthetic given by the general practitioner is due to the smooth induction possible with chloroform.

INTRAVENOUS ANÆSTHESIA

It has been suggested that as intravenous agents give the smoothest induction of all, the ideal anæsthetic for a forceps delivery in the home is thiopentone, 250 mg., followed by nitrous oxide and oxygen, with further injections of thiopentone after the delivery of the baby (Crawford, 1956b). This technique is unlikely to meet with universal approval among general practitioners, for whose use it was intended. Intravenous anæsthesia is not safe in the hands of the occasional anæsthetist, and in the absence of some apparatus capable of inflating the patient's lungs with oxygen, it is definitely contraindicated.

THE USE OF CHLOROFORM

It appears that for all practical purposes the general practitioner wishing to administer a general anæsthetic in the patient's home is restricted to the use of open ether or chloroform. It is true that the use of chloroform is frowned upon by anæsthetists, especially in England, but its reappraisal in the United States (Waters, 1951) and inevitable comparisons with halothane have led to a revival of interest in this most useful, albeit potent, agent. Induction of anæsthesia with chloroform is faster and easier for the administrator, and more pleasant for the patient than ether. The absence of irritation is associated with less breath-holding and mucus production. Maintenance of anæsthesia is more difficult than with ether and therefore more dangerous in the hands of one unaccustomed to its potency.

In the absence of a source of ignition, usually coal, gas or electric fires, the practitioner may change to ether for maintenance after anæsthesia has been induced with chloroform. A smooth induction with ether is difficult and never can it be said to be pleasant for the patient, even when given by the expert in its use. Considerable mucus may be produced even after the use of adequate atropine, resulting in a stormy induction and vomiting before anæsthesia is established. Then the aim is to keep as level a plane as possible, deep enough to be safe from the risk of vomiting—usually heralded by swallowing, or breath-holding—and not too deep to interfere with the contraction and retraction of the uterus, or to depress the vital structures of the child.

If vomiting occurs, its treatment takes priority over all else. The patient

is turned on her side immediately. If she is lying longitudinally along the bed she is lifted to whichever edge of the bed she is facing and her head and shoulders are allowed to hang over the edge. If she is lying across the bed she is pulled by the anæsthetist so that her head and shoulders hang backwards off the bed. Mouth and upper air passages are cleaned out and anæsthesia allowed to become light so that the patient coughs up any vomitus out of reach of the anæsthetist's swab-covered finger. She is replaced on her back and anæsthesia induced once more. This complication may occur during induction, during maintenance if anæsthesia is allowed to become too light, or following the intravenous injection of 0.5 mg. of ergometrine. It is safer, if intravenous ergometrine is to be administered during light anæsthesia, to restrict the dose to 0.25 mg. and to give the other 0.25 mg. by intramuscular injection.

When parturition is completed the patient is turned on her side facing the door, so that any change in colour will be obvious at once, if the nurse leaves the room before the patient is completely conscious. Her upper thigh and leg are flexed, and pillows placed in front and behind her so that she is unable to roll on to her face or on to her back. This position is maintained until the patient is fully conscious.

PUDENDAL ANALGESIA

It is to overcome this danger of vomiting and regurgitation that pudendal analgesia is increasing in popularity, especially in the teaching hospitals. If it is so useful and regarded as an advance with full apparatus and expert anæsthetists, its value in domiciliary practice is correspondingly greater, especially for the single-handed practitioner who combines the roles of inducer of anæsthesia, and obstetrician when the nurse takes over as anæsthetist. It is evident that practitioners recognize the value of this technique by the number of questions on the subject and requests for its inclusion in general-practitioner refresher courses. As with all other forms of local and regional analgesia, results improve with practice. It is not difficult to learn and, ideally, experience in its use is gained at refresher courses where demonstrations are given on models and on patients in the labour rooms, if necessary with the patients under general anæsthesia. For those unable to learn the technique in this way, an excellent description by Hawksworth appeared in *The Practitioner* in June 1958. Although he does not go so far as some enthusiasts who declare that if an obstetric procedure cannot be carried out under pudendal analgesia, it should not be carried out in the home, his preference appears to be for local analgesia.

Equipment.—The equipment required is a 10-ml. or 20-ml. syringe, a hypodermic needle, a wide-bore 5-cm. needle for filling the syringe, a 10-cm. needle for making the actual injections, a gallipot, and a bottle of 1 per cent. lignocaine. Premedication is unnecessary if the patient has complete faith in her doctor and the benefits of the technique for her baby have been explained to her, although it is true that most mothers expect to be

asleep during an instrumental delivery and most practitioners are accustomed to working with their patients under general anæsthesia.

Method.—After scrubbing up and giving the patient the usual vulval and bladder preparation for a forceps delivery, the operator places the forefinger in the vagina and identifies the ischial tuberosity. A skin weal is raised with the hypodermic needle attached to the syringe filled with lignocaine at a point midway between the anus and the ischial tuberosity. Through the weal the long 10-cm. needle is directed down to the ischial tuberosity identified by the left forefinger, and 5 to 10 ml. of the solution are injected after a negative aspiration test for blood. The needle is then partially withdrawn and reinserted to meet the tuberosity slightly more medially and the injection repeated. The needle is then withdrawn until the point lies in the subcutaneous tissues; it is then directed subcutaneously in the labium majus towards the symphysis pubis. The injection is repeated once more while the needle is being withdrawn. The needle is again withdrawn to the subcutaneous tissues and redirected medially along the postero-lateral wall of the vagina, the finger in the vagina making sure that the needle lies just deep to the mucous membrane. The injection is repeated finally during withdrawal of the needle. The whole process is repeated on the other side.

This will enable the practitioner to carry out a low-forceps delivery, or an episiotomy and its repair without any risk to mother or child and at a more leisurely pace than is usually possible with the patient under a general anæsthetic given by the midwife. Manual removal of a retained placenta is possible if the manipulations are carried out with the utmost gentleness, and, if necessary, relaxation of the cervix may be assisted by the inhalation of amyl nitrite (Sauer, 1958). As with all local anæsthetic techniques, care must be taken that an injection is never carried out with the needle point stationary unless repeated aspiration tests prove that the needle point does not lie in a blood vessel.

In 1958, Crawford advocated the use of *hypo-æsthesia* for domiciliary obstetrics (Crawford, 1958a). This is the state produced by the slow intravenous injection of 15 to 20 ml. of sterile water containing 150 mg. of pethidine and 50 mg. of chlorpromazine. After ten to fifteen minutes the patient may be placed in the lithotomy position and, following vulval and bladder preparation, the line of the proposed episiotomy is infiltrated with 1 per cent. solution of lignocaine. The use of chlorpromazine in cases potentially associated with hæmorrhage seems fraught with danger—a feeling apparently shared by Crawford, as, in *The Practitioner* later in the same year (Crawford, 1958b), he advised the substitution of promethazine for chlorpromazine and the addition of 1 mg. of levallorphan tartrate to each 100 mg. of pethidine. Recent work by Dundee on the anti-analgesic effects of promethazine casts doubts on the wisdom of including this drug (Moore and Dundee, 1961).

Despite this recent work the choice for the practitioner still lies between local and general anæsthesia. Pudendal analgesia gives the practitioner all that he requires with complete safety. If this technique is not possible in a given case, e.g. a completely uncooperative patient, or his practice is such that he has to carry out procedures for which pudendal analgesia is inadequate, he should use the simple ether or chloroform techniques with which he is familiar.

THE SPECIALIST ANÆSTHETIST

It has already been noted that one of the factors influencing the choice of anæsthetic by the family doctor is equipment or rather lack of equipment.

In the case of the specialist anæsthetist this does not enter into the discussion. He carries a portable anæsthetic machine, numerous accessories, and drugs, so that he is able to provide anæsthesia for any operation an obstetrician may wish to perform. His choice of anæsthetic depends upon five principal factors.

THE PATIENT

The first factor is the patient. In obstetric anæsthesia it is as well to think of the mother as three patients in one—the mother herself, the labouring uterus, and the fœtus. What may well be the ideal for one may be far from suitable for one or both of the others. Deep ether or chloroform may be necessary to break a contraction ring but is not the first choice if the fœtus is showing signs of distress or the mother suffers from diabetes mellitus. Seldom, if ever, is the anæsthetist greeted with greater relief than by the mother-to-be whose labour has run into difficulties. This relief, and the simple explanation that a sedative premedication is harmful to her child, allow induction of anæsthesia following the use of atropine alone, in contrast to the tranquillity induced by modern premedication before surgery. Induction of anæsthesia, however, may be made easier for the patient by the use of intravenous thiopentone in selected cases.

The possibility of vomiting worries the specialist anæsthetist as much as his general practitioner colleague. He is more aware of the risks, and the lack of facilities contrasts markedly with those of the hospital labour room. There, the bed may be tilted instantly into a steep head-down position so that with the influence of gravity, combined with the effect of a powerful suction, the patient's air passages may be cleaned out at once if the necessity arises. In addition, prophylactic measures of greater efficiency are possible in hospital than in the home. Gastric lavage is often carried out, whereas in domiciliary practice the patient's protests carry more weight. Even if it were possible to attempt this procedure, the patient is worse off after an inefficient gastric lavage than none at all. If it is decided that the stomach must be emptied a request to the patient to open her mouth followed by the insertion of a large airway and holding it there will usually produce the desired effect with little upset. If the technique of pudendal analgesia is advocated for the practitioner to overcome this danger, it is equally valuable to the specialist, perhaps even more so, as with his greater opportunities to practise the block, the greater is his efficiency. The other possible techniques of regional analgesia in hospital practice, caudal and spinal analgesia, have no place in domestic midwifery.

Drugs given to the patient prior to the decision to administer a general anæsthetic should be notified to the anæsthetist. Trichloroethylene analgesia would contraindicate the use of a closed-circuit anæsthetic with carbon-dioxide absorption by soda lime owing to the production of trichloroacetylenes by the action of the hot soda lime on the trichloroethylene. The recent administration of pethidine or an opiate to the mother would make it advisable to have the neonatal strength of nalorphine ready

for administration to the baby rather than the injection of the full-strength solution into the mother before the induction of anæsthesia.

THE OBSTETRICIAN AND THE ANÆSTHETIST

The second factor is the *obstetrician*, who has his own anæsthetist with whom he works as a team with each knowing the other's way of working and appreciating the other's problems. If for any reason the obstetrician cannot obtain the services of his own anæsthetist then both he and the locum tenens will work under a greater strain. Anæsthetic techniques vary slightly according to the mode of working of the operator: for example the position used for delivery, the timing of the intravenous injection of ergometrine, or whether the obstetrician prefers to resuscitate the baby himself or passes him at once to his anæsthetist.

The third factor is the anæsthetist himself. His choice of anæsthetic will depend on his assessment of the other four factors, their relative importance and effect on the technique and drugs chosen.

THE DELIVERY ROOM

The fourth factor is the delivery room. The presence of a coal fire burning in the patient's bedroom or in the next room contraindicates the use of ether, vinyl ether or cyclopropane. If it is essential to use one of these explosive agents in a room heated by an electric or gas fire, the fire must be turned off until the explosive mixture is dispersed, with the aid of an open window. The type of bed is of considerable importance. A double bed allows the patient to lie either transversely across it or diagonally so that the anæsthetist may work at his usual place behind the patient's head. In contrast a single bed with a high bed-head makes it difficult to hold a mask on the patient's face, makes the use of a laryngoscope for endotracheal intubation almost impossible, and dealing with an emergency correspondingly more difficult. Whatever the type of bed, the more luxurious and softer it is, the more difficult is the positioning of the patient. It is generally considered dangerous to strap a face-piece on the patient in obstetrics, as this masks the occurrence of vomiting and prevents the escape of the vomited material. Endotracheal anæsthesia with a cuffed tube has much to recommend it, especially when the anæsthetist may have duties other than the administration of the anæsthetic. After the patient is safely positioned, countertraction may be required during a forceps delivery and both hands may be necessary for the giving of intravenous injections or resuscitating the baby.

THE OPERATION

The fifth factor is the operation requiring the anæsthetic. Premedication is restricted to atropine, 1/100 or 1/75 grain (0.6 or 0.8 mg.) by intramuscular injection, or intravenously if time is short. Pre-oxygenation is practised in all cases in which the second stage has yet to be completed successfully. The patient inhales pure oxygen for five minutes before anæsthesia is induced, as a prophylactic against fœtal hypoxia from the anæsthetic or birth process. If the operation is minor, such as the repair of a small tear, or in some cases

a 'lift-out' forceps in an exhausted patient, nitrous oxide, oxygen and trichloroethylene will suffice.

When the procedure intended is greater, or there is the possibility of its being greater, following oxygenation a Mitchell needle is inserted into a vein on the dorsum of a hand. Through this a sleep dose of thiopentone (150 to 250 mg.) is rapidly injected, followed by suxamethonium chloride (50 to 100 mg.), the dose depending upon the build of the patient and the difficulty expected in intubating. A cuffed endotracheal tube is passed as rapidly and as atraumatically as possible under direct vision and anæsthesia is maintained by artificially respiring the patient with nitrous oxide and oxygen (20 to 40 per cent.). If a closed circuit with an intentional leak is employed, only halothane may be used as a supplement, when there is a source of ignition present. If a non-breathing valve such as a Ruben valve is used, trichloroethylene may be used to supplement the gas and oxygen. If muscle relaxation, either perineal or abdominal, is required, further doses of relaxant are injected through the Mitchell needle. The patient is thus anæsthetized in such a way as to allow the obstetrician to carry out any procedure he may wish, taking as long as he wishes to do so. This technique satisfies the criteria of being non-toxic to the mother, having no ill effect on uterine contractions and being non-depressing to the vital centres of the fœtus.

The use of nitrous oxide, oxygen and halothane sequence is controversial. Induction of anæsthesia is smooth and pleasant but its use appears to involve the risk of interference with the uterine contraction and the vital centres of the child (Embrey *et al.*, 1958: Montgomery, 1961). In general, halothane is not regarded as suitable for cases in which there is the possibility of a considerable blood loss and to many anæsthetists obstetrics comes into this category. On the other hand, the relaxing effect in the uterus is of value in overcoming contraction signs and facilitating the operations of version.

SUMMARY

The choice of anæsthesia in domiciliary midwifery has been discussed with reference to the general practitioner and the specialist anæsthetist.

The difficulties peculiar to anæsthesia for domestic obstetrics have been described and their management outlined.

References

Crawford, J. S. (1956a): *Brit. J. Anæsth.*, **28**, 146.
—— (1956b): *Ibid.*, **28**, 201.
—— (1958a): *Brit. med. Bull.*, **14**, 34.
—— (1958b): *The Practitioner*, **181**, 232.
Embrey, M. P. (1958): *Lancet*, **ii**, 1093.
Hawksworth, W. (1958): *The Practitioner*, **180**, 679.
Montgomery, J. B. (1961): *Brit. J. Anæsth.*, **33**, 156.
Moore, J., and Dundee, J. W. (1961): *Ibid.*, **33**, 3.
Parker, R. B. (1954): *Brit. med. J.*, **ii**, 65.
Sauer, H. H. A. (1958): *Obstet. & Gynec.*, **12**, 221.
Waters, R. M. (1951): 'Chloroform: A Study after 100 Years', Madison, Wisconsin.

CALLING THE LABORATORY

XIX.—VAGINAL CYTOLOGY

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ALTHOUGH it is now nearly twenty years since Papanicolaou first published his results in the detection of carcinoma of the cervix, there still remain divergences of view in this country as to its application and value, even in the larger gynæcological centres. In discussing the indications and techniques of vaginal cytology it will be assumed that the practitioner has access to a cytological service. The pros and cons of such a service and the difficulties of establishing cytological units will then be discussed.

POSSIBLE INDICATIONS

(1) *To confirm a confident clinical diagnosis of carcinoma of the cervix.*—Cytology has no significant part to play in cases in which there is a suggestive clinical history, and speculum examination shows an obvious clinical carcinoma. All such cases must be referred for immediate biopsy, and a smear taken in routine practice will not add anything to the patient's management. Furthermore it is in those cases in which there is a clinically obvious carcinoma that false-negative results are most often obtained; these are due to the smear sometimes consisting only of red cells and degenerate material from the surface of the growth.

(2) *To investigate patients who show any unusual appearance of the cervix.*—The object of the test in these cases is to pick up early infiltrating carcinoma of the cervix in which the speculum examination leaves some uncertainty in the mind of the practitioner as to the nature of the lesion. A positive or suspicious smear in such a case will indicate the absolute necessity for early admission to hospital for biopsy examination. In the hands of an experienced cytologist a negative report from a lesion of this type will virtually exclude carcinoma.

(3) *As a screening procedure to detect cases of preclinical carcinoma (carcinoma in situ with or without early infiltration).*—Cervical cytology can be applied on a large scale by the yearly screening of symptomless women as is done in many parts of the United States, or it can be arbitrarily restricted to patients who have a gynæcological examination for any cause. At present the facilities in this country, except in a few areas, are insufficient for dealing with the application of the principle of systematic population screening, although many gynæcological centres screen all their patients. It must be emphasized that in the great majority of cases of carcinoma *in situ* the cervix either shows no abnormality or shows only the appearances of a benign lesion such as an erosion. It is therefore impossible to diagnose

carcinoma *in situ* on purely clinical grounds. Two questions must be asked in discussing this indication. In the first place, can carcinoma *in situ* be regarded as a true cancer that will eventually infiltrate? Although opinions vary as to the incidence of progression there are cogent reasons for regarding this local lesion as carcinoma. Both retrospective and prospective studies have shown that an infiltrating carcinoma may develop in patients with biopsy evidence of carcinoma *in situ*; microfoci of infiltration may be found on serial sectioning of the cervix and the cytological appearances in carcinoma *in situ* are often indistinguishable from those of an infiltrating carcinoma. Secondly, given that this lesion represents a true carcinoma, what are the

FIG. 1.—Apparatus for vaginal cytology.

chances of picking up such a lesion with systematic screening? A recent article from the Mayo Clinic reports an incidence of detection of preclinical carcinoma as 7.1 per 1000 women screened. These figures are fairly typical of the many reports and agree well with our own experience.

(4) *As a means of diagnosing carcinoma of the body of the uterus.*—Although cells shed from a body carcinoma may be found in a cervical smear the efficiency of the technique for detecting these growths is much less than with cervical carcinoma. It must be emphasized that any patient complaining of post-menopausal bleeding should have a curettage and the clinician should not rely on the smear for excluding carcinoma of the body. The chances of routine smears proving of value in asymptomatic body carcinoma are too small for practical application.

(5) *The smear can occasionally be of value in detecting local recurrences of carcinoma following irradiation treatment of proven carcinoma of the cervix.*

MATERIALS AND METHODS

These consist (fig. 1) of a small polythene pot, with a screw-top lid, which will hold three slides; a wooden spatula as devised by Ayre; a diamond pen

for marking the slide and the fixative solution. Pathologists vary in their preference for a fixative but the two in most general use are Papanicolaou's fixative which consists of equal parts of 95 per cent. ethyl alcohol and ether, and Schaudinn's solution which consists of two parts of mercuric chloride to one part of absolute alcohol.

The majority of pathologists now use only one smear prepared from the cervix by rotating Ayre's spatula in the cervical canal at the time of speculum examination of the vagina. The cervical cells and secretion obtained in this way are smeared on to a slide, which has been marked with a diamond with the patient's name and which is then dropped immediately *while wet* into the fixative. The smear should cover the middle portion of the slide and should not be too thick. Some pathologists like, in addition to the cervical smear, a smear taken by aspiration from the posterior fornix, which is treated in the same way. Once in these fixatives the smears can be forwarded in plastic containers to the pathologist and in our experience they remain satisfactorily in either of these fluids for twenty-four hours. The smear should be accompanied by the following information: the patient's age, her presenting symptoms and the appearances of the cervix on speculum inspection.

PRINCIPLES OF THE TEST

The smears after receipt are processed and stained either by Papanicolaou's method or by hæmalum and eosin. They are then examined microscopically for the presence of abnormal cells which are detected principally on the basis of alterations of nuclear staining properties. In most centres in the United States and in some places in this country, the initial examination is performed by specially trained screening technicians who refer all abnormalities to the pathologist; in the majority of centres in this country the pathologist has to examine the smears himself. It must be emphasized that this examination is time-consuming and also requires special skill and experience to deal with large numbers of slides and to interpret the variety of abnormalities that may be encountered.

INTERPRETATION OF THE RESULTS

The method of reporting the results will vary from laboratory to laboratory, but the majority of cytological reports can be graded into three groups: positive, suspicious and negative. Any person who has a positive smear must, of course, be referred for adequate biopsy of the cervix, for in the hands of most experienced cytologists this diagnosis will indicate with reasonable certainty the presence of a carcinoma. Although some cytologists claim to be able to differentiate a positive smear from a case of infiltrating carcinoma from a positive smear from a case of carcinoma *in situ*, this is not generally accepted. The percentage of false positives will vary with the skill of those interpreting the slides, but even with experts occasional false-positive results may be obtained; these may be due to abnormal cells being produced in

response to infection, or may be from pre-carcinomatous lesions. In the case of suspicious reports the pathologist will usually give some qualifying information such as 'highly suspicious; recommend biopsy'; or 'a few suspicious cells present; suggest repeat'. Final diagnosis and disposal of these cases must wait for the result of an adequate biopsy; the word adequate is stressed because in some cases of carcinoma *in situ* the conventional four-point biopsy may fail to reveal the tumour. If a trained cytologist reports two consecutive positive smears from a patient a negative biopsy should not be taken to have excluded cancer.

DISCUSSION

In a recent annotation in *The Lancet* the use of cervical cytology to detect cervical carcinoma was described as 'setting a whale to catch a sprat'; a statement which implied that in terms of time and expense this was not a valuable routine procedure. At about the same time, in the *Journal of the American Medical Association* appeared an article entitled 'An epitaph for cervical carcinoma'. The author of this article claimed that extensive use of cytology would make it possible for cervical carcinoma to be eradicated as a killing disease. These contradictory views reflect a difference of outlook which is probably mainly determined by economic factors and the difficulty of providing sufficient personnel for such a task. Opponents of the smear technique point out that the cost of detecting one case of unsuspected carcinoma is at least £50 and may be as much as £500. Against this must be weighed the facts that the disease affects women in the prime of life often with large families, that it is a common cancer in women and that it has a relatively poor prognosis once infiltration has occurred. Furthermore, the cost of an extensive smear programme must be balanced against the cost of treating infiltrating carcinoma—a disease which in the end requires prolonged expensive hospital treatment.

In this country the position today is that only a few centres have cytology services open to family practitioners. Where such a service exists it is recommended that it should be used in any case in which the practitioner is uncertain of the nature of a cervical lesion. In addition, if facilities are available a smear should be taken as a routine in any patient between 30 and 50 years who has to have a vaginal examination done. At present it is evident, however, that neither the general public, the practitioner nor the pathologist is ready for a systematic screening programme.

PRINCIPLES OF REHABILITATION

VII.—FURTHER AIDS TO PERSONAL INDEPENDENCE

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Having discussed last month aids to feeding and lavatory facilities, this month I propose to discuss the equally important problem of aids to dressing and washing.

DRESSING

It is of the utmost importance to try and get a handicapped person to wear as normal or as nearly-normal-looking clothes as possible. In the case of the trunk this means clothing the upper half by means of vests, shirts, cardigan, and coat-type garments. This should be possible in every case in which there is at least one good limb: i.e. one possessing reasonable grip and sensation in the hand, and adequate movement at the elbow and shoulder, particularly with internal rotation. For example, the hemiplegic in whom the arm has not recovered should be trained to dress completely with the one remaining arm. Certain modifications may be necessary: for example, shirts with collars attached; large buttons and button-holes; zipps and, if the remaining hand was not previously the dominant one, elastic cuff-links; ties with ready-tied knots, elastic loops to go over the head, and thumb loops on any long sleeves of undergarments and coats to prevent these riding up the flaccid arm when the sleeves of the outer garments are pulled on. If, however, both upper extremities are severely involved, either through stiffness or paralysis, armholes and neckholes may have to be enlarged, or indeed the garment split down its whole length, thereby becoming the wrap-round type.

In order that these patients may be able to dress completely unaided, it is essential for the finger and thumb of one hand to be able to reach beyond the big toes and it is worth while bearing in mind that loss of this function can be produced by a wide variety of conditions:—

(i) Conditions which prevent flexion of the trunk and hips:
(a) stiffness of the dorso-lumbar spine, (b) stiffness of hips, (c) large waist-line.

(ii) Conditions which prevent the feet being brought near to the body: i.e. stiff knees.

(iii) Conditions which prevent the hands being brought near to the feet: i.e. stiff shoulders and/or flexed elbows.

If these conditions exist, they can sometimes be overcome when putting on trousers: for example, by lassoing the feet by means of the braces attached to the trousers. Socks, however, will need a special gadget which must (i) grip the sock, (ii) keep the mouth of the sock open, (iii) have a long enough handle to enable the patient to reach beyond the toe, and (iv) be

sufficiently strong, though temporarily attached to the sock, to enable it to be pulled on and over the heel.

In the old days the problem of shoes and boots was solved by grandfather's elastic-sided boots into which the feet could be wriggled. The modern counterpart is the pre-tied elastic shoelace in a shoe which has one side of the tie of the tongue stuck or sewn to the adjacent portion of the upper, and by means of a long-handled shoehorn the patient is able to hold the shoe while the foot is wriggled into it (fig. 1). Sometimes more support is required than is given by the elastic shoelaces and this can be obtained by fitting the patient's shoes or boots with a zipp fastener which has a ring attached to it and can be operated by a hook on a suitable means of dowelling.

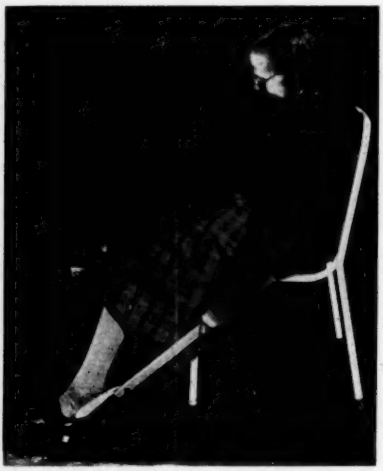


FIG. 1.—Patient with elastic shoelaces already tied easing on shoe with long-handled shoehorn.

With trousers, pants, skirts and the like, the further problem arises of getting the appropriate part of the garment under and up beyond the buttocks. In cases in which the patient has not sufficient strength or agility to lift his seat off the chair or bed, it may be necessary to do the garment up, so to speak, back to front. This, of course, is easier to arrange in the case of a skirt than trousers. In very severe cases it may be necessary to redesign the ordinary pair of trousers. There is one principle which must be observed here and that is that the centre of the fork portion of the trousers must be left intact; otherwise the garment tends to disintegrate into two separate tubes of cloth.

Burton's of Winchester were most cooperative in making up some prototype garments and one form which we found very useful consisted of a pair of trousers completely sewn up the front except for a small three- to four-inch (7.5 to 10 cm.) opening which was controlled by a zipp. The central part of the fork was normal but the garment was very generously cut around the back in the form of two flaps which folded over behind the person. This had the merit that they were convenient for 'toilet'. Should it be felt that this is a precarious type of garment, it should be stressed that it was worn by those people who were permanently chairfast.

Finally, with the wrap-round type of garment it will be found that certain heavily handicapped people with weak arms, trunks and legs can be taught to roll from one side of the bed to the other and in this way to be able to put on the wrap type of garment without assistance.

We have been experimenting for some time with the new Bri-nylon fastener, 'velcro', using it particularly for patients who have difficulty in

doing up buttons, trousers and belts, and also as a quick means of attaching a light plaster working splint to the patient's hand. So far, it seems to have stood up well to repeated washing in warm water and will, we feel, prove a valuable help to those who cannot manage the more orthodox fastener.

WASHING

Primarily, washing may be divided into soaping, rinsing and drying. More specialized conditions occur in teeth-cleaning, shaving, hair-washing: the legitimate female parallel of shaving is the application of lipstick and powder.

FIG. 2.—Bench-type bath seat with steps.

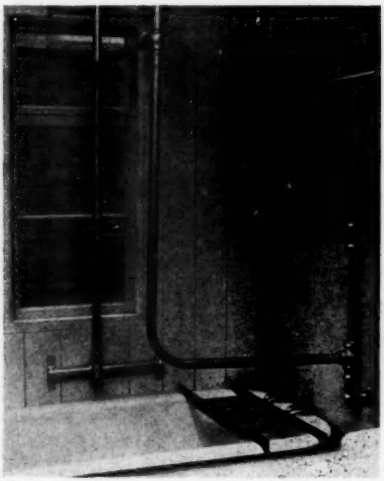


FIG. 3.—Showing suitably placed vertical parallel bars, the nearer one being bent through a right-angle to allow for easy entry of leg into bath.

Generally, washing consists of methods of applying these processes to the face, hands, trunk and feet, and are of course dependent upon some degree of grip and mobility in at least one upper extremity. The problem with regard to the face and head is similar to that involved in eating except that the reach has to be extended a little farther. The next problem is entering and leaving the bath. This involves considerable strength and acrobatic ability, particularly when one considers the slipperiness of a soapy bath. There are three modifications or aids for this, the simplest being:

(i) The wedge-in seat.
(ii) A bench-type seat with steps (fig. 2).
(iii) Suitably placed hand rails (fig. 3). Here one must condemn the short horizontal type placed just above the level of the bath since it is suitable for pulling oneself from the prone to the sitting position, but requires the strength and skill of a trapeze artist to obtain the standing position from then onwards.
(iv) The overhead track, hoist and slings.

Certain individuals may not be able to manage these methods but can obtain a reasonably good wash 'all over' by sitting on a slatted type of wooden

seat in front of a shoulder-level shower with conveniently placed hand control (fig. 4). It is not our practice to fit mixer valves; we find it is cheaper and more reliable to put in a small cistern containing water which has a thermostatically controlled temperature of 110° F. (43.3° C.) in series with the supply to the shower. This reaches the patient's body at a temperature of approximately 105° F. (40.5° C.).

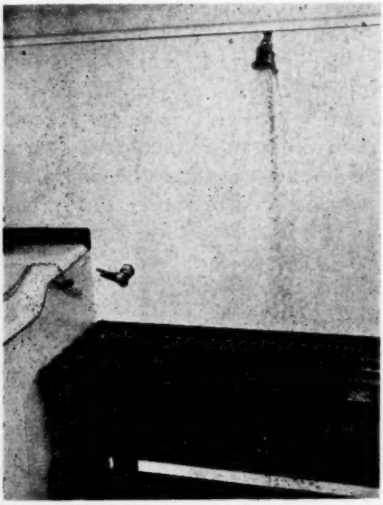


FIG. 4.—Slatted bath seat with shoulder-level shower and easy lever-type tap control.

There is on the market a bath known as a 'drop-sided bath' in which one side of the bath is 3 to 4 inches (7.5 to 10 cm.) lower than the rest, thereby reducing the depth of the bath from an average of 16 inches (40 cm.) to about 13 inches (33 cm.). It is important if fitting one of these baths to remember to raise it up on four or five courses of bricks or else the patient on climbing over the side of the bath is nearly sitting on the floor.

DRYING

The problem of drying involves the ability and agility to get the towel to all parts of the body. Certain hemiplegic individuals find the ordinary roller type of towel, attached high up on the door by elastic, a convenient way of providing a reciprocal movement essential to towelling.

With regard to drying the head, if there is a fair degree of disability in the upper extremity, it is usually advisable to use a hot-air hair-dryer in conjunction with one of the new plastic attachments which consist of a 2- or 3-inch (5- or 7.5-cm.) diameter plastic tube connected with the hot-air output of the dryer and continues for 2 or 3 feet (60 or 90 cm.) when it is extended into a bathcap type of end with elastic round the free edges. This enables it to remain firm in position over the head while the hot air is blown through the hair.

CLEANING THE TEETH AND SHAVING

Cleaning the teeth 'in situ', i.e. in the mouth, should not present any difficulty if the remarks in the previous article are borne in mind.

Shaving, however, can be a problem and the patient may require an extended handle to the razor or it may even be necessary to have an electric razor fixed up at an appropriate height and distance from the patient so that the razor remains stationary on the patient and by head movement he brings the appropriate areas into contact with the cutting head.

REVISION CORNER

ANOREXIA NERVOSA

ANOREXIA NERVOSA is easy to diagnose, but it probably demands the greatest firmness of management of any psychiatric disorder. The illness consists of gross weight loss in the absence of bodily disease, due to persistent failure to eat or retain food, the superficial psychological complaint being a fear of becoming fat. Mild forms consisting of transitory loss of appetite and weight accompanied by amenorrhœa are seen commonly in young women who are under stress. The fully developed form, to be considered here, occurs rarely in males, and the vast majority of sufferers are single women between the ages of 18 and 25. This is a continuous process with no natural remission so that the untreated patient may starve herself to death or remain in a chronic debilitated state. The personality of the patient is the key to the diagnosis, understanding, and treatment of this process, for it combines both the obsessive and hysterical traits which fit them to undertake exacting work in public, but also allow them, once ill, to keep their heads in the sand with marked persistence. They are often introverted, oversensitive, compulsive, stubborn and masochistic in some degree.

CLINICAL PICTURE

The patient is often brought up by a relative who is deeply concerned about the gradual loss of appetite and weight over a period of many months. At the first interview, reasons for the onset may be obscure, but often the girl has been overweight and has been chaffed about this by school friends, workmates or, more seriously, by a boy-friend. A successful attempt to slim follows this or other emotional disturbances and, once 15 to 30 pounds (7 to 14 kg.) have been lost, there follows a revulsion for food and a fear of gaining weight again. Constipation is invariable, and vomiting may be intractable, whilst amenorrhœa is always noticed within a month or so of the outset.

On examination, wasting, dehydration with hyperkeratosis, and even gross emaciation may be found. There is great variation in the amount lost, but it is not uncommon to see girls who have lost more than half their body weight, reaching 70 pounds (32 kg.) or less by the time they can be persuaded to seek medical help. A growth of downy hair develops on the extensor surfaces of the forearms and legs and on the back, the hands and feet are cold and blue, the blood pressure is low, and the pulse is slow. The patient's demeanour contrasts vividly with this serious physical deterioration. Not only does she show lack of concern, but she is active, alert and energetic far beyond expectation.

It has been thought that the phobia of gaining weight is but a symbolic fear of becoming pregnant, that it serves to detract parental attention from

a rival sibling, or that it is a form of self-punishment. There is no generally accepted view about psychological mechanisms, but evidence for this is unnecessary for diagnosis or immediate treatment.

The *differential diagnosis* from pituitary cachexia, disease of the gastro-intestinal tract, or tuberculosis can usually be made clinically. The anorexic subject complains of nothing and maintains that she is perfectly well. There are no atrophic changes or physical signs apart from emaciation, with occasional œdema of the legs. Other psychological causes of weight loss, such as depression and schizophrenia, can be excluded on the history alone.

TREATMENT

Once the diagnosis has been made, the patient should be admitted to hospital, for the physician must avoid involvement in, or the responsibility for, the patient's efforts to remain ill. Excuses to avoid admission must be overcome immediately and the aid of relatives should be sought early. The patient resists more confidently at a later interview if she succeeds at the first.

Complete bed rest is essential. The patient should reach her previous average weight before being allowed up for any reason, and the highest weight reached previously should be equalled before discharge can be considered.

The staff must be aware of the difficulties in management that will occur. Girls of good character will adopt every subterfuge to avoid taking food or tablets. They will vomit into bedpans, out of the window, or into emptied hot-water bottles, conceal food in lockers, in the bed, or in knitting bags, while soaking their bedclothes with milk mixtures. Tablets can be concealed under dentures even under supervision. There will be an attempt to split the staff by falsely quoting Sister's instructions to the most suggestible nurse, and even excellent nurses are sometimes tempted to tip the untouched food, intended for the patient, into the pig-bucket rather than confess to Sister their first failure to persuade a sick person to eat. A disunited staff will be worn down and despondent long before the patient gives in.

No attempt to make the patient eat in quantity is made until chlorpromazine in increasing doses has been given regularly for several days: the usual range is from 300 to 800 mg. daily. At this time, 40 to 60 units of soluble insulin should be given at 07.00 hours for six days a week, breakfast being delayed until the patient is sweating or otherwise hypoglycæmic. If a sufficiently large dose of chlorpromazine is maintained and absorbed, there are very few patients who cannot be persuaded to eat, although full supervision of meals is necessary until the patient is allowed up. On this regime, recently described by Dally and Sargant, several pounds—i.e. 1 or 2 kilograms—a week can be gained and normal weight can often be reached within six weeks. Complaints about side-effects of chlorpromazine should be treated with antidotes such as orphenadrine rather than by

lowering a dose that is producing an increase in body weight. A daily weight chart with horizontal lines to indicate the target for getting up and for discharge is a simple way of demonstrating progress to the patient, relatives and staff.

Psychotherapy has an important place in treatment, both in hospital and after discharge. If the patient merely eats her way out of hospital, she will soon starve herself in again. The resentment aroused while doing what she is told and while under supervision will outlast the physical benefits of treatment and motivate a relapse unless the physician has the patient's respect and has established rapport. The latter relationship depends upon the doctor's firmness in treatment, understanding and interest in underlying factors and willingness to undertake thorough after-care.

Frank discussions are usually sufficient to help the patient over immediate difficulties and towards a solution of the conflicts associated with parents, work, or a love affair, which may have precipitated the decline. The patient's life may need reorganization so that she may function adequately within her peculiar but valuable range of talents, but attempts should also be made to re-educate her in more mature attitudes to life.

AFTER-CARE

When the patient's full weight is restored and maintained, menstruation will often return after several months, even after many years of amenorrhœa, without hormone therapy. Appetite improves as normal weight is approached, but relapse can be avoided only if these patients are seen at weekly intervals initially and later every month for a period of two years. The weight measured at the doctor's surgery is the only real guide to progress. If weight is steady while the patient is back at work, leading a social life, and even a limited sexual relationship, the intervals between attendances may be confidently increased.

Although poor appetite is the common difficulty after discharge, there are some who begin to overeat with as much compulsion as they previously neglected their nutrition. This is an indication for further psychiatric advice. Mild forms of depression are not uncommon, and although they respond well to anti-depressant drugs, they are noticeably intensified by the use of stillbœstrol.

CONCLUSION

It is often many years before one can feel that all that needed to be done for these patients has been done, but their potential is good and they usually succeed in their careers subsequently. Their initial ingratitude is overshadowed once they have developed sufficiently to resume their place in the world.

JOHN POLLITT, M.D., M.R.C.P., D.P.M.
Physician in Psychological Medicine, St. Thomas's Hospital.

NOTES AND QUERIES

Air Travel and Acclimatization

QUERY.—Does a quick translation (by air) from sea level to Switzerland (6000 feet [1830 metres]) involve any medical risk for middle-aged and elderly people?

REPLY.—For normal healthy individuals of middle-age there is no medical risk in a quick journey by air from the United Kingdom to a Swiss mountain resort at 6000 feet. At this altitude the arterial oxygen saturation will be reduced only 3 to 4 per cent. and there is little or no extra demand on the cardio-respiratory compensatory mechanisms. At first there may be a feeling of increased tiredness after physical activity and it must also be remembered that alcohol and excessive tobacco smoking significantly reduce altitude tolerance.

Very elderly persons with diminished cardiac reserves or those suffering from any clinical anomaly affecting the transport of oxygen, may find physical effort somewhat exhausting until they become acclimatized to local conditions.

The beneficial effects on certain chest conditions of the pure clean air at 6000 feet in Switzerland must not be overlooked, and several sanatoria are situated approximately at this height.

A. S. R. PEFFERS, M.B., CH.B.

Hay Fever in Young Children

QUERY.—My daughter, who was five in April, suffers from hay fever which has become more severe each year since its onset at the age of two. Up to now she has been treated with 'elixir benadryl' and an 'antistin-privine nasal spray'. This treatment, however, was not very satisfactory last year, as the 'benadryl' had to be repeated at least three-hourly and she wakened up two or three times every night in a very congested state. I should be grateful for advice on the treatment of young children with this condition, especially with regard to a suitable long-acting antihistamine for use at night.

REPLY.—No treatment of hay fever is as yet satisfactory. Although some would disagree, I do not recommend hyposensitization, except for unusually severe cases. The repeated pricks are disliked by children, the reactions are unpleasant and the results are doubtful.

I recommend a trial of different antihistamine drugs, in order to find the one which most suits the child. I should try the following:—

(1) Cyproheptadine ('periactin'), dose 6 to 16 mg. daily at age 2 to 14. A single dose is said to be effective for four to six hours.

(2) Triprolidine ('actidil') elixir, containing 1 mg. in each 4 ml. The dose would be 1 mg. at night. The effect is said to last for up to twelve hours.

(3) Diphenylpyraline ('histryl' spansules). The dose for a child is one 2.5-mg. spansule. The effect is said to last for twenty-four hours.

(4) Chlorpheniramine ('piriton' duolets). One 8-mg. duolet at night. The effect is said to last for eight to twelve hours.

I would not use nasal decongestants. They tend to have a secondary congestant effect, so that the child is worse off than he was before he started.

PROFESSOR R. S. ILLINGWORTH, M.D., F.R.C.P., D.C.H.

Poliomyelitis Immunization in India

QUERY (from a reader in India).—It is recommended for poliomyelitis immunization that we start the first dose when the child is six months old. Maternal antibodies are supposed to protect the child until this age. But in countries like India where the disease is rare, are we to suppose that maternal antibodies will protect the child up to six months of age? Recently there was an epidemic, the first of its kind in India, in two districts of Andhra Pradesh where even infants under six months were affected with the paralytic type. Can we start the immunization earlier than six months in the face of such a situation?

Many children do not have triple vaccine in a systematic order starting with three months of age. In such cases, how should we space polio vaccine and triple vaccine? What should be the interval between the two vaccines?

REPLY.—The question of starting immunization against poliomyelitis with inactivated (Salk) vaccine before the age of 6 months cannot be satisfactorily answered until the answers to certain other relevant questions are available.

The first of these is: Is poliomyelitis rare in India? The sparse information available from serological surveys and from the incidence of the disease in paralytic form supports the view that, in urban areas, 50% of the population have experienced contact with all three types of polio virus by the age of two years, and 90% by the age of 10 years. This gives good cause for believing that maternal antibodies exist in the majority of neonates in Indian urban areas—a fact that must weigh heavily against the proposal to immunize infants before the age of 6 months.

Another question, to which there is as yet probably no complete answer, is whether in such a community mass immunization of infants with inactivated vaccine is a sound immuno-

logical procedure. The WHO Expert Committee on Poliomyelitis in its Second Report (Wld Hlth Org. techn. Rep. Ser. No. 145, 1958, p. 12) recommended:—

'The question of introducing or expanding existing programmes for vaccination against poliomyelitis with inactivated virus vaccines must be decided locally . . . In considering whether or not immunization procedures should be undertaken it is important that each country should not only bear in mind its past experience but also attempt to estimate what may happen in the next decade. This applies particularly to those areas where the reported cases have been few and epidemics unknown. Superficially it might appear that such countries would be ill advised to embark on extensive vaccination programmes in view of the meagre returns they could expect. However it has been characteristic that in many parts of the world poliomyelitis has recently tended to show a sharp increase in prevalence, sometimes in the form of severe epidemics . . . Once epidemic poliomyelitis has appeared in such an area an increased incidence of the disease tends to be maintained except in so far as it may be influenced by artificial immunization'.

The suggestion has been made that the 'neutralizing' influence of maternal antibodies on inactivated virus vaccine administered in the first few months of life might be successfully overcome by using a more potent inactivated virus vaccine. Trials of concentrated Salk-type vaccines are at present in progress; some have already been successful.

Of topical interest is the possibility of using oral attenuated virus vaccines. Although much remains to be learned about the proper time and place to administer live virus vaccine, it is already generally accepted that it has distinct advantages when used in the face of epidemics, and at a recent conference convened by WHO it was agreed that the live virus vaccine 'may become the method of choice in countries where there is a high incidence of clinical disease in infancy'.

In answer to the final question, the spacing of triple vaccine and Salk-type poliomyelitis vaccine is not a great problem: in some countries (for example, France and Canada) it is not considered a problem at all and the vaccines are given together as a quadruple vaccine, apparently with successful results. An excellent suggestion for the fitting-in of the two vaccines separately in children who are 'late-starters' with their immunization schedule has been given by Dr. Ian Taylor (*Brit. med. J.*, 1959, **ii**, 884).

D. A. CANNON, O.B.E., M.B., D.T.M. & H.

DDT and Parathion Poisoning

QUERY (from a reader in India).—In the Indian villages in which we practise, more than 60 per cent. of the people used to suffer from malaria, but since the introduction of DDT almost every house has a stock of DDT and we do not get a single blood film which contains the malarial parasite. Sometimes, however, we have cases of DDT poisoning, particularly among children who take DDT accidentally. What steps should be taken in a case of DDT poisoning?

The year before last, in Southern India, several soldiers died as a result of their food being adulterated by 'follidol'. This occurred because bags of wheat and of 'follidol' had been kept side by side in the ship. What is the chemical nature of 'follidol'? Does it belong to the same group as DDT? What is the treatment for poisoning with it?

REPLY.—The first signs of uncomplicated DDT poisoning are nausea and vomiting and this is followed by excitement with numbness and tingling of the extremities, and in severe cases there may be partial paralysis. Such cases are rare and have usually followed the accidental incorporation of DDT powder into food. DDT is completely insoluble in water and many preparations of this insecticide are made up in kerosene or similar organic solvents. Poisoning by such preparations of DDT when accidentally swallowed by children is usually due to the solvent.

There is no specific treatment for DDT poisoning but apprehension and excitement are readily allayed with phenobarbitone. It should be emphasized that no fatal cases of poisoning in man by DDT *alone* have been recorded. Death, usually rapid and preceded by coma, has occurred when solutions of DDT have been swallowed and must be attributed to the effects of the solvent.

'Folidol' is the German trade name for the organo-phosphorus insecticide o-o-diethyl-o-*p*-nitrophenyl phosphorothioate—generally known as parathion. This insecticide is used in agriculture and not in public health work, and has been responsible for a great many deaths all over the world. It acts as an anticholinesterase and treatment of poisoning is by repeated large doses of atropine and, if available, the specific reversible agent pyridine 2-aldoxime methiodide (P_2AM).

J. M. BARNES, M.B., B.CHIR.

Portable Apparatus

QUERY.—What is the best type of portable oxygen outfit suitable for carrying by a G.P. in emergencies and where can it be obtained? Also where is a suitable set for transfusion of dextran obtainable for obstetric emergencies?

REPLY.—Portable oxygen equipment may be obtained from Normalair Ltd., 27 Minshull Street, Manchester 1, or from Walter Kidde Co. Ltd., Belvue Road, Northolt, Middlesex. Possibly the most convenient apparatus for general practitioner use would be the 120 litre oxygen set which Messrs. Kidde supply complete with lightweight portable cylinder (just under 5 pounds [2.3 kg.] measuring about 18 inches (46 cm.) in length, control head, carrying bag,

breathing mask and connecting tube. This is part no. K 15897 and costs approximately £19 10s. The cylinders supplied may be recharged from an ordinary oxygen cylinder. This apparatus can deliver oxygen at either 2 or 4 litres/minute controlled flow. A pressure gauge is part of the apparatus and cylinders can be changed by hand, no spanners being necessary. For the newborn, a flow-rate of 2 litres per minute is too high, but a simple funnel can easily be attached to the connecting tubing, so that with escape of the gas round the baby's face the effective supply is adequately reduced.

Sterile disposable sets for administering solutions such as dextran may be obtained from Baxter Laboratories Ltd., London Road Trading Estate, High Wycombe, Buckinghamshire. The most suitable set for a general practitioner to carry with him has a reference R.410a and costs about 5s. 4d., when bought in quantities of less than 36 at a time. It is complete with a sterile, 20-gauge intravenous needle.

T. H. S. BURNS, B.M., F.F.A.R.C.S., D.A.

Management of Tracheotomy in Infancy

QUERY.—An infant, now aged eleven months, had an emergency tracheotomy about two months ago for acute laryngotracheobronchitis. He has made an uneventful recovery from his illness, but is unable to breath normally without the tracheotomy tube. At first he became cyanosed almost immediately after the cannula had been removed, but now he seems to breath quietly for about half-an-hour without it, but thereafter his breathing is wheezy and progressively more difficult and exhausting. He is unable to manage without the tube for more than thirty hours. Is this a case of chronic laryngeal stenosis? Replacement of the tracheotomy cannula by a smaller one and occlusion of the tube with a cork (at first a partial occlusion and then a complete one) have failed to re-educate him to breathe through his mouth and permit the removal of the cannula.

What is the correct treatment for this condition and what is the prognosis as to ultimate cure and the risks of sequelæ? What are the risks of air travel in his present condition and what precautions should be taken for aspirating the mucus from the tracheotomy tube during the flight?

REPLY.—The history given with regard to this child is not at all unusual. Unless the tracheotomy tube can be removed within a short time of cannulation it is always difficult to get it out satisfactorily but, in my experience, though it may take months before the child can go without the tube, eventually the tube can be removed and normal breathing is restored. This is provided that the original tracheotomy has been a correctly placed low one. The management of these children is important in that, of course, the tube and the lower trachea must be kept clear by suction and frequent changing of the tube and at no time must any blockage be allowed to occur. The child must always be breathing easily and comfortably through his tracheotomy tube. He should have an examination every month by direct laryngoscopy and bronchoscopy, and any granulations which may have collected around the tracheotomy opening should be dealt with via the laryngoscope and via the external opening from the outside. If it is considered practical after one of these endoscopies it is my practice to leave the tube out and after the anæsthetic has worn off to give the child fairly heavy sedation and antihistamine therapy and hope that normal respiration will be restored. If this is so the tracheotomy hole will close rapidly of its own accord and no suturing is needed. Unfortunately sometimes, as appears to be happening in this case, the child has to have the tube reintroduced after a few hours without it, but this is not at all uncommon and the procedure is repeated in a month's time.

With regard to the risk of air travel, if it is essential, there should be no risk provided a complete spare tube is carried, there is adequate suction available at all times, the infant is accompanied by somebody who is accustomed to dealing with tracheotomies and that oxygen is available. The difficulty with these children is, of course, that the trachea has no cartilaginous rings and tends to collapse, and this makes it a much more difficult problem than a similar condition in an adult.

H. S. SHARP, F.R.C.S.

Amblyopia

QUERY.—How soon does a small child with a marked squint develop permanent amblyopia due to suppression of the appropriate cerebral function? I have a child of about 22 months with such a squint, and he is so uncooperative that the local ophthalmologist was unable to examine him, so treatment has been put off for a year. The point at issue is whether or not the good eye should be occluded, at any rate intermittently, in order to make him use his faculties and prevent any permanent suppression of cerebral function, or whether the condition can be allowed to continue untreated until he is three or four.

REPLY.—Amblyopia can usually be overcome by occlusion of the better eye up to the age of eight years. After that age, the acuity may in-

crease following occlusion but standard acuity is unlikely to be obtained. At 22 months of age, physical occlusion by an obturator is unlikely to be successful, but the use of an atropine drop, 1 per cent., every second day will produce a similar effect. The drug may be used in each eye in alternate months.

STEPHEN J. H. MILLER, M.D., F.R.C.S., D.O.M.S.

Recurrent Anal Ulceration

DR. D. G. DESAI (India) writes:—With reference to the query and reply on recurrent anal ulceration (April 1961, p. 529), I have noted remarkable relief in two of my patients following applications of 0.5% hydrocortisone skin ointment. I am tempted to believe that the condition is due to sensitization of the peri-anal skin, due to altered flora or pH.

PRACTICAL NOTES

Pertussis Vaccination

OF the 50 children who died from whooping-cough in England and Wales in 1958 and 1959, 14 (28%) were below three months of age, and 26 (52%) were below six months of age, according to W. C. Cockburn (*Monthly Bulletin of the Ministry of Health and the Public Health Laboratory Service*, May 1961, **20**, 93). There was no indication that the deaths were commoner in children living in poor social conditions, but deaths were more frequent than expected in families of three or more children, 'owing probably', it is suggested, 'to the increased risk of the introduction of infection by their older brothers and sisters'. Although it is concluded that early vaccination is unlikely to reduce deaths to a still lower level, it is considered that it would help to shield babies from infection if the number of children over 1 year of age given a full course of vaccination was brought to the highest possible level. In order to prevent babies from being infected by their brothers and sisters it may be necessary to give reinforcing doses to children, before school entry. 'A dose at this age', it is said, 'would probably keep the immunity of the children concerned at a high level for at least three or four years'. Further, it is pointed out, 'general practitioners could help to shield babies by ensuring that children in families in which the mother is pregnant are well vaccinated before the birth of the baby'.

A New Wound Dressing

RESULTS of a clinical trial of a new type of non-adherent wound dressing, 'melolin', are reported by W. A. T. Robb (*British Journal of Plastic Surgery*, April 1961, **14**, 47) who used it in 80 patients with various types of wound. These included: operative incisions, 20; granulating wounds, 24; burns, 10; skin grafts—donor site 15, recipient site 11. The dressing consists of a perforated polyester film with an absorbent lint backing and is easily applied to all wounds except those of the fingers where moulding to the contours 'sometimes proved troublesome because of wrinkling of the film'. Dressings were changed at intervals varying from one to seven days or over, and in 20 cases in which they were changed frequently they were alternated with petroleum gauze dressings in order to compare results. In the 80 cases treated the dressings were readily removed in all except five, in which they were slightly adherent, four experiencing some discomfort. In the remaining 75 no pain was experienced, which compared favourably with the results in those cases in which petroleum gauze was used as an alternative dressing: 10 patients felt some pain when it was removed and in 12 it was 'adherent to some degree'. The dressings proved 'a satisfactory covering for wounds closed by primary suture. Any blood which oozed from the wound edges was readily absorbed by the lint and the stitches did not become enmeshed in the dressing. No sensitivity reaction or tissue irritation was noted in any wound'. Whilst this dressing is unsuitable for wounds which have a profuse or thick purulent discharge, it 'appears to exhibit the properties of a non-adherent dressing to a greater degree than has been experienced with other forms of dressing'.

Chlorpropamide in Diabetes Mellitus

'IN the majority of patients over 40 years with stable diabetes, by the second day of treatment one should be in a position to adjudge whether the patient will respond to chlorpropamide', according to A. P. Grant and M. W. J. Boyd (*Irish Journal of Medical Science*, February 1961, p. 41). This conclusion is based upon their findings in a series of 23 patients, aged 49 to 77 years, in none of whom was there a previous history of ketosis or of wide variation in insulin requirements. Seven of the patients were included in the series because of unsatisfactory response to previous treatment—three on insulin and four on diet alone. The remaining 16 patients were new diabetics. The initial dosage of chlorpropamide was 500 mg. each morning. One patient had to be excluded from the final analysis because of non-conformity

with the diet. Of the remaining 22, one patient failed to respond, and in three the dosage had to be increased to 750 mg. in two and 1000 mg. in one. The remaining 17 showed a significant fall of average daily blood sugar on the second day of treatment and a continued drop in this level for five to eight days. The patient who did not adhere to the prescribed diet had to have her daily intake of chlorpropamide increased to 1000 mg., but when her dietary error was corrected the daily requirement of chlorpropamide 'dropped smartly' to 500 mg. No toxic effects were observed. It is stressed that 'the same dietary care is essential in control of patients judged suitable for treatment with chlorpropamide as in those on insulin'.

Triamcinolone Acetonide in Psoriasis

'VERY encouraging' results in the treatment of psoriasis were obtained with intralesional injections of triamcinolone acetonide by M. D. Readett (*British Journal of Dermatology*, March 1961, **73**, 107) who reports on their use in eleven patients. A typical acute case was that of a woman aged 37 years in whom two areas were injected. These cleared in ten days although the untreated areas deteriorated. In all cases the treated areas cleared in a maximum of seventeen days, although erythema in the cleared areas persisted for up to fourteen days in some patients. In several cases lesions which had been present for up to ten years also cleared within ten days. The injections were given subcutaneously in a strength of 6 mg. per ml. in four cases and 5 mg. per ml. in the remainder. The ages of the patients ranged from 13 to 81, and follow-up periods ranged from three to six months. Even in those patients who developed further lesions none of the injected areas became reinvolved.

Treatment of Spondylitis

THE advantages of deep x-ray therapy in the treatment of ankylosing spondylitis far outweigh its disadvantages, according to F. Dudley Hart (*Clinical Radiology*, April 1961, **12**, 130). His 'therapeutic programme for spondylitis is:—

(1) To enforce the general rules of living an active life; to instruct the patient when to rest and when to be active, with emphasis on exercise and exercises for the spine, thorax and girdle joints.

(2) The proper use of simple analgesics.

(3) If the above is not enough, phenylbutazone or one of its derivatives is prescribed, and, finally, if the condition is not controlled by these measures

(4) Irradiation is given and is regarded as very useful in selected cases'.

Equally satisfactory results from the use of deep x-ray therapy are reported by J. S. Fulton (*Ibid.*, p. 132). A five-year follow-up of 573 cases shows that improvement occurred in 72% of those in stage I, 62% of those in stage II, and 54% of those in stage III. Blood changes developed in only five patients following irradiation: simple secondary anæmia in three, aplastic anæmia (fatal) in one, and subacute myelogenous leukæmia (fatal) in one. The conclusion reached is that 'the benefits of x-ray treatment outweigh the risks of damage to the hæmopoietic system. The risks of x-ray therapy in ankylosing spondylitis are negligible'.

Iodide 'Mumps'

IN reporting two cases of 'acute painful parotid swelling after oral ingestion of iodides', J. E. Carter (*New England Journal of Medicine*, May 11, 1961, **264**, 987) draws attention to considering such a possibility in the differential diagnosis of mumps. In both patients the parotid swelling developed within about twelve hours of taking quite small doses of iodides: equivalent to 30 and 24 mg. of iodine, respectively. In both the swelling subsided within seventy-two hours, but one of the patients was admitted to hospital and kept there for a week as she had also angioneurotic œdema of the face and bronchospasm. It is therefore recommended that 'the parenteral and oral use of iodides should be considered and inquired about when one is making a differential diagnosis of acute painful parotitis'.

Methocarbamol in Acute Alcoholism

METHOCARBAMOL, a muscle relaxant, is 'an effective medication for the relief of skeletal muscle hyperactivity in acutely alcoholic patients', according to J. J. Lofaro (*New York State Journal of Medicine*, March 15, 1961, **61**, 897) as a result of his experience with 100 consecutively admitted alcoholics in a penal institution where 65% of the population are acutely alcoholic. The only medication received by these patients during the period of study was methocarbamol. On the first day, 1 g. in 10 ml. was given intravenously in a period of three to five minutes. On the second day, 2 g. were given in this way, and on the third day, 3 g. Subsequently 77 patients were given methocarbamol orally for four days: four tablets (500 mg. each) four times daily for two days and then three tablets four times daily for two days. At the end of the three-day course of intravenous therapy, 22 patients had 'complete relief of purposeless skeletal muscle hyperactivity' and there was no return of such

hyperactivity during an observation period of from six to twenty-two days. One other patient developed such severe delirium tremens that methocarbamol therapy had to be suspended. Of the 77 patients who received oral therapy, 51 were free of tremor as a result of the intravenous therapy. By the end of the four-day course of oral therapy, all but four of the patients had lost their tremor, and in three of these four only a 'mild residual tremor persisted'. The only side-effect encountered was slight lightheadedness with drowsiness. As this was most marked when 3 g. of methocarbamol were given intravenously, it is recommended that the daily injection should not exceed 2 g.

Nitrogen Mustard in Nephrosis

As a result of their experience with 22 cases, G. Lagrue and his colleagues (*La Semaine des Hôpitaux*, March 2, 1961, **37**, 781) consider that nitrogen mustard is a satisfactory drug for the treatment of certain cases of nephrosis. Their best results were obtained in those patients with 'primary nephrosis' who had responded well to corticosteroids, but in whom corticosteroid therapy had had to be given up because of side-effects: all four patients in this group responded well to nitrogen mustard. Among the five patients with 'primary nephrosis' in whom corticosteroid therapy became ineffectual or dangerous, the results with nitrogen mustard therapy were: one complete remission, two partial remissions and two failures. In the remaining cases the results were not so satisfactory. Thus, of the 10 cases of 'mixed nephrosis', none had a complete remission, three had partial remissions, and seven did not respond at all. The age of the patient had a considerable effect upon the response: among the 12 adults there were two complete remissions, one partial remission and nine failures, whilst of the ten children three had complete remissions, five had partial remissions, and only two did not respond at all. The conclusion reached is that nitrogen mustard is a form of therapy which is useful in cases of 'primary nephrosis' which do not respond to corticosteroid therapy or in which such therapy is contraindicated. On the other hand, it is a form of therapy which is not without its dangers, and must therefore be used with circumspection.

Hyaluronidase Activity During Menstruation

THAT oral disturbances during the menstrual period, such as herpetic lesions, gingivitis and localized periodontitis, may be due to increased hyaluronidase activity at this time is the suggestion put forward by R. L. Speirs (*British Dental Journal*, March 21, **110**, 204), following saliva tests in twelve subjects. All were healthy students between the ages of 18 and 20 who experienced regular twenty-eight-day cycles and did not need to take analgesics to relieve pain: this last fact was important because mild analgesics had been found to produce saliva with little or no hyaluronidase activity. Samples of 15 ml. of 'wax-stimulated whole saliva' were collected from each girl at the same time of day on the eleventh and twenty-sixth to twenty-eighth days of the cycle and also several samples during the five days of the menstrual period. In nine of the students there was 'a marked rise' in the hyaluronidase activity during the menstrual period (usually towards the end), although often this high level lasted for only one day. 'Hyaluronidase depolymerizes the hyaluronic acid of the connective tissue ground substance, and leads to the disappearance of cementing substances. It can thus promote the invasion of tissues by bacteria or their products'. Other workers have found a correlation between hyaluronidase activity and oral disturbances and it is concluded that 'it would be of interest to study the variation in the levels of this enzyme throughout the menstrual cycle in a large number of persons, particularly those who are susceptible to such oral disturbances'.

Leucocyte Counts

THE results of 1,643 total and differential white cell counts performed on 69 healthy men are reported by H. C. Jeffrey (*Journal of the Royal Army Medical Corps*, April 1961, **107**, 93). These counts were done hourly for twelve hours on two successive days. The range of the total white cell count was 3,050 to 15,800 per c.mm., with a mean of 7,650. The range of the polymorph count was 896 to 10,660 per c.mm. (mean 4,049), with a mean percentage of 55.6. The corresponding figures for the lymphocyte count were: 658 to 6,300 (2,813), 39.5%. In 11 cases the total white cell count fell below 4,500 per c.mm. more than once, to a maximum of 15 counts in one man. Polymorph counts were below 3000 per c.mm. once only in six men, more than once in 37, and in all the 24 counts in two men. Lymphocyte counts were once below 1000 per c.mm. in two men, and in one twice. Only once was a lymphocyte count below 750 per c.mm. The daily variation in counts showed a gradual rise from morning to afternoon, with a definite digestive leucocytosis, the rise occurring about one hour before a meal and reaching a peak one hour after. In view of these findings it is stressed that 'little emphasis should be placed on a single white count in a patient'.

REVIEWS OF BOOKS

The Newborn Child. By D. G. VULLIAMY, M.D., M.R.C.P., D.C.H. London: J. & A. Churchill Ltd., 1961. Pp. 163. Illustrated. Price 15*s*.

THE great virtue of this little book is its simplicity. In some 150 pages of bold print and clear illustrations the author gives an account of the infant, his disorders and his management. Just because it is so clear and short, it is more impressive than many more wordy and ambitious books. There is a useful section on normal infants, which contains much practical advice: on taking the infant's blood pressure, for example. Among the abnormalities described, the crisp summaries of such conditions as 'the pulmonary syndrome' and hæmolytic disease of the newborn will be of the greatest value to the busy family doctor, who has been tempted to throw in his hand because of the vast amount written on them. Anybody with time and a typist can turn out a book containing most of the available information on a given subject. To write a small book, excluding unimportant details but emphasizing important conditions, is more difficult. Dr. Vulliamy has done this admirably, and what he writes is clearly based on his wide practical experience. There may be differences of opinion on a few small points. He might have omitted such rarities as arthrogryposis multiplex (fig. 30) and myasthenia gravis; and he might have written a little more (in the good discussion on breast-feeding *v.* bottle-feeding) about emotional aspects, such as the 'guilt feeling' of mothers who are bullied into breast feeding but fail. The general balance of the book, however, is admirable, and the advice given is sensible and practical.

It is fashionable to deride didactic teaching, whether by the spoken or the written word. This small book shows that it can be both attractive and useful, and it is strongly recommended, particularly for general practitioners.

Surgery of the Anus, Rectum and Colon. By J. C. GOLIGHER, CH.M., F.R.C.S. London: Cassell & Co. Ltd., 1961. Pp. 829. Illustrated. Price £8 8*s*.

THIS book is a 'must' for all general surgeons, and indeed, also, for those who specialize in anal, rectal and colonic surgery. Although there is a tendency towards more and more specialization, the large intestine accounts for a good deal of a surgeon's most rewarding work. In these pages can be found all the answers, and a wealth of experience. The book is well written, and easy to read, and at once conveys the author's complete familiarity with the subject. One can appreciate that he has met the difficulties, and he tells us how they may be surmounted. Refinements of technique, so very necessary in these days, are described fully. Controversial matters are discussed, and it is refreshing to note that throughout the entire book the author gives us his own honest opinion upon these matters. Where his experience has led him to doubt accepted methods, he has said so, and why. He has not omitted treatments of which he has had little or no experience, but in these cases one is told why this is so, and conclusions can be drawn. It is perhaps a pity that more is not written about the Peutz-Jeghers syndrome as this has aroused a good deal of comment recently. The presentation of the work in one easily handled volume is ideal. Headings enable one to find almost anything with great ease, despite a rather inadequate index. The type is clear and easy to read in spite of the fact that some of it is rather small. The illustrations, both photographs and drawings, are clear, helpful and usually well reproduced. The bibliography is extensive and modern, and particularly helpful articles have special attention drawn to them in the text.

Only two chapters are not written personally by the author. These are concerned with specialized abnormalities of infants and children. Mr. Harold Nixon has managed to equal the high standard set by the rest of the book and gives a fully detailed account of these diseases, the problems which they present and the manner in which they are handled.

Professor Goligher has drawn largely on his experiences while he was at St. Mark's Hospital, a debt which he freely acknowledges. Nevertheless this is his personal effort and one of which he may long be proud, for it will remain a standard work for many years.

The Practical Management of Head Injuries. By JOHN M. POTTER, M.B., B.CHIR., F.R.C.S. London: Lloyd-Luke (Medical Books) Ltd., 1961. Pp. 84. Illustrated. Price 12*s*.

HEAD injuries are so common that all doctors should know something about the principles of treatment, and it is, of course, quite impossible for all cases to be handled by specialists. One disadvantage of specialization is that it lessens the responsibility of others for a particular type of injury or illness and yet there is an obvious

need for straightforward brief description of how to handle, position and observe a case of head injury from the earliest moments after the accident onwards to the supervised rehabilitation and return to work. Mr. Potter has a wide experience of head injuries, and he explains quite clearly what are the things that really matter. This little book contains the information that should be easily available in every small hospital admitting accidents.

A Study of Home Accidents in Aberdeen. By IAN A. G. MACQUEEN, M.D., D.P.H., F.R.S.H. Edinburgh: E. & S. Livingstone Ltd., 1960. Pp. 100. Price 12*s.* 6*d.*

IN recent years deaths from burns in the home have been twice as many as those from poliomyelitis and fatal home accidents have exceeded the number killed on the road. The Aberdeen Health and Welfare Department launched a home safety campaign and while it was in progress conducted an inquiry into the facts. This book is both a record and a statistical analysis of the findings. The campaign was clearly necessary and highly successful. Dr. MacQueen is to be congratulated on his responsible and imaginative leadership; on deploying his health visitor staff to the best advantage in this and in other directions in accordance with 'the concept of the family health visitor'; in marshalling the information obtained; and in drawing sound conclusions about the incidence, cause and avoidance of home accidents.

The book is not easy reading because of its high statistical content but nevertheless should be read and kept for reference as a well-ordered store of knowledge on this subject and a constant reminder to all of us to neglect nothing in the prevention of these appalling accidents.

Toxicity of Industrial Metals. By ETHEL BROWNING, M.D. London: Butterworth & Co. (Publishers) Ltd., 1961. Pp. 340. Price 50*s.*

TECHNOLOGICAL advances in industry are resulting in the use of the newer and rarer metals in manufacturing processes, while at the same time the older metals are used in increasing quantities. The toxicological hazards of the older metals are well known, whilst those of the newer metals are still coming to light. Dr. Browning has written a really comprehensive account covering the metabolism and toxic effects of all the metals used in industry and, in addition, has included concise information on their physical and chemical properties, preparation and utilization. Diagnostic tests and treatment are discussed when this information is available. There is an extensive bibliography. This book will be of the greatest value to all directly concerned with industrial health and a most useful work of reference for physicians.

Cholera: Its Pathology and Pathogenesis. By S. N. DE, M.B., D.T.M., PH.D. Edinburgh: Oliver and Boyd, 1961. Pp. 141. Illustrated. Price 25*s.*

AMONG Professor De's original contributions to our knowledge of cholera are his demonstration of an 'enterotoxin' in cell-free filtrates of cholera cultures and his ingenious method of infecting rabbits with the disease. Accounts of these and other features of experimental pathology are given in this book which also ranges widely over other aspects of the disease. A brief historical outline leads up to the author's theory that cholera is not necessarily of Asiatic origin and evidence is adduced that it may have occurred in Europe before the great pandemics of the nineteenth century. This must remain a matter of conjecture, but most readers will probably be content to accept the views of observers such as Macnamara, who were writing 100 years nearer the events. There is an interesting chapter on cholera in Calcutta, the author's home ground, which, as he points out, is the most overcrowded city in the world, where the sanitary services have inevitably lagged behind the great and continuing increase of the population. Attention is drawn to the gaps in our knowledge of the pathogenesis of cholera. For example, how does it happen that a patient can lose 10 or 12 litres of fluid from the bowel in twenty-four hours? Professor De discusses various explanations but does not include the possibility that the diarrhœa is due to a failure of resorption of the large amounts of fluid and electrolytes which recent work suggests are secreted and reabsorbed by the normal intestine.

This book is a helpful introduction to the problems of cholera and gives many useful references to earlier work. The author has enthusiasm, ability and opportunity and we can be confident that further advances in our understanding of cholera will come from him and his fellow-workers in Calcutta.

Congenital Deformities. By GAVIN C. GORDON, M.B., F.R.C.S.ED. Edinburgh: E. & S. Livingstone Ltd., 1961. Pp. 127. Illustrated. Price 37*s.* 6*d.*

THIS book is difficult to review because of its erudition. The author has made a deep study of his subject. Briefly, he has arrived at conclusions about the etiology of congenital dislocations of the hip and from this he induces a theory of causation of Perthes' disease and osteoarthritis

of the hip. Only in recent times has thinking related to the origin of congenital dislocation of the hip left the realms of philosophy and been subjected to the scientific method. Congenital dislocation of the hip is the result of a genetic factor, a simple irregular dominant. Incoordination between two vital processes arrests development of the acetabulum. The femoral head as a result of intra-uterine posture and muscle pull is enabled to dislocate and reduce itself, in both pre- and post-natal life. The genetic causation of congenital dislocation of the hip does not exclude the probability that abnormalities of intra-uterine pressure form the basis of other types of congenital deformity.

Those with whetted appetites should read the book—it will repay close study. A most scholarly volume; the author is to be congratulated.

The Role of Speech in the Regulation of Normal and Abnormal Behaviour. By A. R. LURIA. Oxford: Pergamon Press Ltd., 1961. Pp. 100. Illustrated. Price 50*s*.

IN spite of the apparently inevitable tendency for communism to impinge on all aspects of Russian life, including research, Soviet workers have made a notable contribution to our knowledge of the working of the mind. Unfortunately much of this knowledge has not been available to non-Russian readers. It is for this reason that this book, which consists of a translation of three lectures delivered in the University of London, will prove of interest to all practitioners. Professor Luria is one of the outstanding Russian workers in this field and his three lectures provide a succinct summary of Soviet views on the subject. Dominated by the Pavlovian mechanistic approach, they will not appeal to all psychologists and psychiatrists, but for the ordinary clinician the book makes stimulating reading. Not the least of its attractions is the account of the methods used for the investigation of the child's growing mental capacities. Even though one may not be prepared to accept the underlying thesis of these investigations, the findings cannot be ignored and undoubtedly represent a useful contribution to this difficult field of clinical investigation.

Origins of Alcoholism. By WILLIAM MCCORD and JOAN MCCORD. London: Tavistock Publications, 1960. Pp. 193. Price 35*s*.

THIS is the first longitudinal study of the genesis of alcoholism. It is based on the examination of 255 male subjects, average age nine years, who were considered to be potential delinquents and were under observation for ten years by social workers, doctors and psychiatrists. An additional 255 subjects, the normal group, were interviewed and observed for the same length of time. It is interesting to find that the current theories on alcoholism are not borne out by the findings in this survey. The hereditary basis of alcoholism was not statistically significant. Metabolic and glandular disorders are ruled out. Of the psychological theories, both Freudian and Adlerian investigations gave negative conclusions, but Robert White's theory that the disease may be a response to a suppressed conflict between dependent drives and aggressive urges on the whole fits the facts uncovered by this study. It was also found that alcoholism was strongly related to paternal criminality, all of which would suggest an environmental rather than a hereditary explanation.

Considering the importance and magnitude of this work, it seems carping to criticize, but one cannot help but notice that the social background of the group studied was certainly not representative of all strata of American life. The main criticism, however, is that throughout the book the authors refer to neural disorder as being of great significance, but not once do they attempt to qualify this. One is left wondering whether they refer to epileptic disorders or other neurological lesions.

With its detailed statistical evidence of the findings, this can be considered a major work on the study of alcoholism, and of enormous importance in the study of the problem.

Island of Terrible Friends. By BILL STRUTTON. London: Hodder and Stoughton, 1961. Pp. 192. Price 15*s*.

IN 1944, Major James Rickett, R.A.M.C., was posted to the small Jugoslav island of Vis. Occupied by partisans and a group of fifty commandos it was expected to be captured any day by the Germans who occupied all the surrounding islands as well as the neighbouring mainland. When Major Rickett arrived on the island he found one other British surgeon there —Captain George Lloyd Roberts. The island was never captured and when Major Rickett was transferred back to the Italian mainland it had not only repulsed every effort of the enemy to capture it but had been converted into a fortress that was wreaking vengeance on the hated invader of the Balkans.

The 'Island of Terrible Friends' tells the story of Major Ricketts' experiences in conditions which were more reminiscent of the Crimean War than anything else. It is a tale of courage, versatility and brilliant improvisation which one reader at least had difficulty in laying

down before he reached the last page. Written by a cheerful Australian who can tell a good story without using the first person, and who knows enough surgery to pass scrutiny, it provides a fascinatingly exciting account of one of the most dramatic and least known of the minor campaigns in the 1939-45 War. Major Rickett is the hero of the book. A Guy's man, he has been described by his surgical chief there as 'probably the best house surgeon I had in thirty years, certainly the most cheerful. He assisted dexterously. He led the dressers and charmed the Sisters, and looked after his patients with a devotion I have seldom seen excelled'. All these, and many other attributes, are admirably brought out in this tale of war 'surgery' in the raw. It is a tale that no doctor can afford to miss.

NEW EDITIONS

A Text-book of Midwifery, by R. W. Johnstone, C.B.E., M.D., F.R.C.S.ED., F.R.C.O.G., and R. J. Kellar, M.B.E., M.B., CH.B., F.R.C.S.ED., F.R.C.P.ED., F.R.C.O.G., eighteenth edition (Adam and Charles Black, 45*s*.).—This very good book has been brought up to date and now includes results of much recent research and practice. The balance of the presentation of the new material is excellent, as would be expected of these two distinguished authors. Further pruning might improve the book still more. It is doubtful if descriptions of internal version, destructive operations and the like are of value to either students or practitioners for whom the work is intended. Really rigorous editing could make the volume even better than it is.

The Premature Baby, by V. Mary Crosse, O.B.E., M.D., D.P.H., D.OBST.R.C.O.G., fifth edition (J. & A. Churchill, 24*s*.).—This valuable book is now over fifteen years of age and the new edition keeps up the standard of the earlier versions. It is essentially practical, and the author has revised many of the details of the care of prematurely born babies especially as regards environmental factors. The sections on respiratory difficulties have been brought into line with modern views on the 'respiratory distress syndrome'. (In view of recently published work, it is unfortunate that intragastric oxygen is still recommended.) The statistics on mortality have been brought up to 1959 and emphasize the improvements of the past twenty years in Birmingham. That improvements have also been achieved elsewhere is in part due to Dr. Crosse's painstaking work.

Pharmacology, The Nature, Action and Use of Drugs, by Harry Beckman, M.D., in its second edition (W. B. Saunders Co., £5 8*s*. 6*d*.) has undergone careful revision and can still therefore be recommended as an admirable reference book for the student. Its value for the British reader would be considerably enhanced did it include a list of British equivalent approved or official titles. Mepacrine, for instance, is not in the index. A curious omission is the absence of any reference to the new synthetic (or semi-synthetic) penicillins, and potassium perchlorate is not mentioned in the treatment of thyrotoxicosis. Griseofulvin is dealt with rather summarily, and no reference is made to any of the publications on the subject from this antibiotic's country of origin.

A Synopsis of Physiology, by C. C. N. Vass, M.SC., PH.D., M.B., CH.B., fifth edition (John Wright & Sons Ltd., 30*s*.).—The appearance of a new edition of this book, originally written by Rendle Short, will be welcomed by pre-clinical students and fellowship candidates. The thirteen years' interval since the last edition has necessitated a very extensive rewriting by Dr. Vass, who is now the sole editor. The incorporation of much new material has fortunately been achieved with little increase in the total length of the book, which fulfils admirably its purpose of supplementing rather than replacing the standard textbooks. A new feature is the inclusion of many tables, which postgraduate workers will find useful for reference.

Surgery for Nurses, by James Moroney, M.B., CH.B., F.R.C.S., seventh edition (E. & S. Livingstone Ltd., 32*s*. 6*d*.).—In its seventh edition since 1950, the revision of this essentially practical textbook will ensure its continued popularity. The author shows awareness of current surgical problems in stressing the paramount importance of asepsis, and includes valuable information on the prevention of surgical infections. The book contains a vast amount of knowledge unavoidably condensed, yet easily assimilable and presented in a manner which makes its 761 pages effortless reading. An almost equal number of illustrations are skilfully dispersed throughout the text. These alone make the book good value for the money. For the nurse with a sound background of school teaching and ward experience this book is recommended without hesitation. It has the unusual quality of making instruction a pleasure.

The contents of the August issue, which will contain a symposium on 'Diet and Nutrition', will be found on page A 130 at the end of the advertisement section.

Notes and Preparations see page 129.
Notes from the Continent see page 133.
Fifty Years Ago see page 135.
World Health News see page A 11.
Motoring Notes see page A 89.
Travel Notes see page A 95.
Bridge Notes see page A 99.
From a Sussex Window see page A 101.

NOTES AND PREPARATIONS

NEW PREPARATIONS

'NAVIDREX-K' tablets each contain 0.25 mg. of cyclopenthiazide and 600 mg. of potassium chloride, and are said to be especially suitable for long-term diuretic therapy. The potassium chloride is contained in a 'slow-release core' which 'avoids gastric and intestinal irritation, nausea and the uncertain absorption associated with enteric coating'. Available in bottles of 25, 100 and 500 sugar-coated tablets. (CIBA Laboratories Ltd., Horsham, Sussex.)

'OTOTRANE' adhesive ear paint contains phenylmercuric dinaphthylmethane disulphonate, 0.1 per cent.; prednisolone, 0.5 per cent.; inert high molecular weight carboxyvinyl polymer ('carbopol'), 0.75 per cent.; 90 per cent. alcohol, 33 per cent. It is described as a viscous, non-staining fluid for intra-aural application which will maintain prolonged contact with all surfaces of infected aural cavities. Available in collapsible metal tubes containing 5 g. (sufficient for twelve applications.) (Ward, Blenkinsop & Co. Ltd., Fulton House, Empire Way, Wembley, Middlesex.)

'P.R. SPRAY' is a cooling skin spray containing 85 per cent. of trichlorofluoromethane and 15 per cent. of dichlorodifluoromethane, and is intended for the relief of pain due to reflex muscular spasm. Its advantages are said to include the facts that it is non-toxic, non-inflammable and that its vapour has no general anæsthetic effect, making it 'convenient and suitable for domiciliary use by the patient'. It should not be used on inflamed or broken skin. Available in pressurized containers of approximately 5 fluid ounces (142 ml.). (Boots Pure Drug Co. Ltd., Station Street, Nottingham.)

'ROBAXISAL' tablets each contain 250 mg. of methocarbamol and 2½ grains (150 mg.) of acetylsalicylic acid and are intended for use in disorders in which there is severe pain as well as spasm. They are said to have proved beneficial in conditions such as 'low back pain of uncertain origin and pain and spasm associated with arthritis'. Available in bottles of 50 and 500 tablets. (A. H. Robins Co. Ltd., 5 Fenchurch Street, London, E.C.3.)

PHARMACEUTICAL NOTES

DISTILLERS CO. (BIOCHEMICALS) LTD. announce that their thalidomide preparation, 'distaval', is now available in liquid form as a suspension containing 50 mg. of thalidomide in each 5-ml. teaspoonful. Issued in bottles of 60 ml. (Broadway House, The Broadway, Wimbledon, London, S.W.19.)

DUNCAN, FLOCKHART & CO. LTD. announce that their preparation of ethyl chloride B.P. is now available in a new pack consisting of a screwneck glass bottle fitted with an injection cap of compressed nylon. Two forms of cap are supplied: a white one with a coarse jet for general anæsthesia, and a black one with a fine jet for local anæsthesia. (16 Wheatfield Road, Edinburgh 11.)

GLAXO LABORATORIES LTD. announce that their streptomycin sulphate preparation, 'strepolin', is now available in a strength of 0.75 g. Issued in cartridges containing 1.5 ml. (50 per cent. solution) and vials containing 3 ml. (25 per cent. solution), in boxes of 10. (Greenford, Middlesex.)

NICHOLAS LABORATORIES LTD. announce that their preparation, 'parmacetyl', for the oral treatment of hæmorrhoids, is now available in an additional pack containing 100 tablets. (225 Bath Road, Slough, Bucks.)

SANDOZ PRODUCTS LTD. announce that their thioridazine preparation, 'melleril', is now available in the form of a syrup, containing 25 mg. of thioridazine base in each 4-ml. teaspoonful. Available in bottles of 100 ml. and 1 litre. (Sandoz House, 23 Great Castle Street, London, W.1.)

A NEW FEATURE

On p. A 101 of this issue, readers will find the first in a new series of articles entitled: 'From a Sussex Window'. As the sub-title indicates, this is a naturalist's diary and to many readers the concluding initials (C.G.L.) will divulge the identity of the author. 'C.G.L.' is not only one of the ablest writers in the medical profession at the present moment, he is also, like so many good doctors, a born naturalist. From his retreat in Sussex, where the Downs meet Romney Marshes, he will provide a running commentary on the course of Nature as the seasons span the course of the year.

PRIZES FOR NURSES

THE Council of the British Medical Association is prepared to consider the award of prizes during 1962 for essays submitted in open competition by nurses. Prizes to the value of 20 guineas and 10 guineas will be awarded in each of five categories, open to nurses in various grades, including student, state registered, and pupil nurses. Full details may be obtained from the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

COURSES AND CONFERENCES

The Treatment of Cancer, with special reference to radiotherapy and chemotherapy and the scientific basis of recent developments, will be the subject of a course to be held in Cambridge from September 20 to 23, 1961, under the auspices of the University of Cambridge School of Clinical Research and Postgraduate Medical Teaching. The course is open to university and hospital medical and scientific staffs and registered medical practitioners. Full details may be obtained from the Secretary, The Medical School, Tennis Court Road, Cambridge.

THE *First International Congress of Food Science and Technology* will be held in the Imperial College of Science and Technology in London from September 18 to 21, 1962. Full details may be obtained from the Honorary Secretary, Mr. F. J. Griffin, A.L.A., F.R.E.S., 14 Belgrave Square, London, S.W.1.

EMPIRE RHEUMATISM COUNCIL

DURING the past ten years the Council's annual expenditure on medical projects has increased from £4,648 to the record sum of £56,800 in 1960, as noted in the recently published annual report for that year. Special projects during the year included the opening of the Council's electron microscopy unit at St. Thomas's Hospital Medical School, the establishment of a further unit for research on the action of drugs, at King's College Hospital Medical School, the raising of a sum of £200,000 among local industrialists to cover the cost of a special wing at Queen Elizabeth Hospital, Birmingham, where research into blood abnormalities is under way, and the completion of the first field survey to discover how many people in Britain suffer from rheumatoid arthritis at any one time.

HISTORY OF MEDICINE

ALTHOUGH the Faculty of the History of Medicine and Pharmacy, of the Society of Apothecaries, has only been established for two years, at the end of April 1961, it had a membership of 304 and no less than 65 universities, medical schools and postgraduate institutes had enrolled as corporate members. A 'Society of Apothecaries Lecturer in the History of Medicine' has been appointed by St. Thomas's Hospital Medical School, and the governing body of King's College Hospital Medical School have approved the establishment of a similar appointment. These and other interesting details of the work of the Faculty are given in the second annual report and list of members for 1960-61.

THE CLERGY AND MENTAL HEALTH

A COURSE of instruction for ministers of religion on 'mental health and the problems associated with its maintenance' is one of the innovations at The Retreat, York, noted by the physician superintendent in his report for 1960. The course consisted of ten lecture-demonstrations of approximately three hours, given once a week, and was not intended to 'make clergymen into psychiatrists in ten easy lessons' but to show how a mental hospital worked, what could be done to help patient and relatives over the admission, and in what ways the doctors could be assisted in their work by the support of the clergy. The response to invitations to join the course exceeded expectations, and it is hoped to give a number of such courses each year and 'perhaps extend them to other persons whose work brings them into contact with the problem of mental illness'.

FAMILY PLANNING ASSOCIATION

THE Family Planning Association has continued to open new clinics at the rate of one every fortnight, according to the Association's annual report for 1960-61. This brings the total to 336 clinics run by 271 branches. Local health authorities and regional hospital branches provide facilities and accommodation for four-fifths of these clinics and refer patients to them. In all, some 300,000 individuals attended the clinics during the year. The great majority of these are women, but an increasing number are being accompanied by their husbands and fiancés.

EMERGENCY STEROID THERAPY

A MINISTRY of Health memorandum, H.M. (61) 39, refers to the dangers of suddenly interrupting steroid therapy and notifies the issue to hospitals and general practitioners of a standard card which may be carried by patients undergoing such treatment. In the event of any emergency the essential facts will be available to a doctor who may have to treat the individual concerned. Intended for issue to all patients whose health might suffer if steroid therapy were discontinued, the cards contain the relevant information in standard form. They are conveniently small and fit into a transparent plastic envelope. Patients should be told the purpose of the card and the importance of carrying it at all times should be stressed. It is, of course, essential that the information recorded should be kept up to date.

PRESCRIBING FOR DIABETICS

THE British Diabetic Association has drawn attention to the fact that the Ministry of Health has agreed to long-term prescribing for patients

with certain chronic diseases who may need constant drug treatment. The recent doubling of the prescription charge may mean that an increased and undesirable financial burden would otherwise fall upon them. In cases of hardship the patient may, of course, apply to the National Assistance Board for help; but those who look after diabetic patients may like to know of the following prescribing arrangements. The items mentioned below may be prescribed for long periods, even up to three months, irrespective of the quantity ordered, if the doctor thinks this is desirable.

(1) Insulin (one or two types)
(2) Insulin syringe (B.S. 1619)
(3) Needles (luer mount)
(4) Spirit for sterilization ('Industrial' is best)
(5) Cotton-wool ('Hospital pack' is cheapest and satisfactory)
(6) Tablets for urine testing
(7) Sulphonylurea tablets

THE NORWEGIAN MEDICAL ASSOCIATION

THE issue of *Tidsskrift for Den Norske Lægeforening*, the journal of the Norwegian Medical Association, dated June 1, is a special number published to commemorate the 75th anniversary of the Association. It is a handsomely produced volume of which the editorial board has every reason to be proud, and provides an admirable picture of the development of the Association.

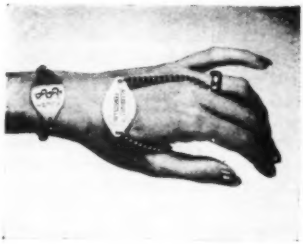
ARMY DUODENAL ULCERS

IN the last war peptic ulceration was responsible for as many discharges from the armed Forces as were actual wounds and was only surpassed by psychiatric casualties, whilst in 1958 the rate for invaliding for peptic ulcer in the Army was 1.1 per 1000 male other ranks, a rate exceeded only for psychiatric disorders. Lieut. Col. W. O'Brien (*J. Roy. Army med. Cps*, 1961, **107**, 85) has therefore investigated the records of 100 soldier patients with radiologically proven duodenal ulcers. As the Army tends to invalid men with duodenal ulcers if the diagnosis is made in the early years of their engagements, those chosen for review were divided into two categories: 50 within three years of joining the Army, and 50 who had had many years' service.

In the younger group the two most interesting features were that 80% of them had developed their symptoms in civilian life, and 48% 'gave a positive history in first degree relatives' (compared with only 18% of the older men). In both groups 54% of the men belonged to blood group O compared with 46% of the general population. Stress was a common precipitating factor in both groups. In the young group there were three main causes of stress: frustration with army life (28%), army diet (24%) and family worries (24%). In the older group, family worry (38%) headed the list ('in a surprising number divorce proceedings had precipitated symptoms'), followed by periods of intense work (24%) and army food (10%). Only 13 of the men conformed to the traditional asthenic type: '72% were noted as having excellent physiques and many were athletes, some of distinction'.

A MEDICAL TAG

'FORTY-THOUSAND patients across America now wear a medic-alert bracelet or disc engraved on the reverse in telegraphic prose: "allergic to horse-serum", "epilepsy", "diabetes", "hemophilia", or "I am taking anticoagulants" ', according to a report in the *Rhode Island Medical*



Journal (1961, **44**, 160). The Medic-Alert Foundation of California, which started the plan in 1956, is a non-profit organization. Its emblems are of either sterling silver or stainless steel and are supplied in three forms: a bracelet, a disc or a lady's charm bracelet, or a disc with a 24-inch chain for neckwear. A choice of 17 standard inscriptions is available, but three additional lines may be added at an extra cost of 50 cents a line.

THE HIGHEST HOSPITAL IN ASIA

IT is expected that this month will see the coming into being of what has been described as 'the highest hospital in Asia'. This will be at Leh, the only settlement of any importance in Ladakh which lies south of the Ladakh range, which runs along the upper Indus in Kashmir. Situated at a height of 14,000 feet (4,270 metres), it is primarily a hospital for the Indian Army units which guard this uneasy section of India's frontiers, and in the first instance will have 200 beds, but eventually it is to be expanded to a 400-bedded hospital which will also meet the needs of the nomadic inhabitants of this isolated territory.

AMERICAN CHAMBER-COOLERS

'I UNDERSTAND that Victorian chamber-pots, whether of the willow or other patterns, are

being collected in the United States, where they serve as receptacles filled with ice for keeping champagne or wine bottles cool'.—'Miscellaneous Notes' (Eleventh Series), by F. Parkes Weber, M.D., F.R.C.P., F.S.A.

ELIZABETH GARRETT ANDERSON

MISS J. G. MANTON writes: I have been commissioned to prepare a detailed biography of Elizabeth Garrett Anderson, M.D., to be published in 1965, the centenary of her qualification, and am anxious to trace any documents relating to her career. If any of your readers have autographs, letters or other papers, which they would be kind enough to lend, these would be copied, promptly returned and, of course, fully acknowledged at publication. My address is 44 Westgate, Chichester, Sussex.

PUBLICATIONS

Current Therapy 1961, edited by Howard F. Conn, M.D., has undergone the thorough revision which has characterized its predecessors. As a reliable practical guide to therapy it can be recommended without hesitation. (W. B. Saunders Co. Ltd., price 87*s.* 6*d.*)

Clinical Hæmatology, by R. D. Eastham, M.D., D.C.P., is similar in design and intent to 'Biochemical Values in Clinical Medicine'. The size of a small pocket book, it is packed with information on normal and abnormal values in various investigations used in hæmatology. There is also much other useful information, and numerous references to the literature. This is a most valuable *vade mecum* for all concerned with the performance or interpretation of hæmatological investigations. The only criticism is that its title could be more appropriate, since it is concerned with the laboratory rather than the ward. (John Wright & Sons Ltd., price 15*s.*)

Black's Medical Dictionary, by William A. R. Thomson, M.D., has now appeared in its 24th edition and 188th thousand. As the dust cover points out 'this book stands between a technical Dictionary of Medicine and a guide to the domestic treatment of the commoner ailments'. New sections have been added on barrier creams, poisonous berries and phenylketonuria, as well as many new drugs, whilst other sections —such as those on chronic alcoholism, leprosy and mental illness—have been entirely rewritten. (A. & C. Black Ltd., price 38*s.*)

Parasitology (Protozoology and Helminthology) in Relation to Clinical Medicine, by K. D. Chatterjee, M.D., is the third edition of Dr. Chatterjee's book to appear in as many years, which is good evidence of the success it enjoys. A further 34 illustrations have been introduced into the text, which has undergone various minor alterations and additions. As an introduction to clinical parasitology this book gives better value for money than any of its competitors. (K. D. Chatterjee, price Rs. 18.75.)

Preparing for Your Baby, by Philip Rhodes, F.R.C.S., M.R.C.O.G., and *Hearing and Not Hearing*, by R. Scott Stevenson, M.D., F.R.C.S. ED., are two new *Family Doctor* booklets. (British Medical Association, price 1*s.* each.)

Health, by Tony Chase, M.B., B.CHIR., Christian Focus Series No. 13.—The author asks 'What has health to do with Christianity?'. He answers by presenting the world health problem—Britain enjoying the fruits of the Welfare State while two-thirds of the world is destitute. On this background he describes life in a missionary hospital, which raises a vision of what would happen if the whole world were organized in love. This book should be read especially by doctors in search of a career. (Edinburgh House Press, price 2*s.*)

National Register of Medical Auxiliary Services. The *Register of Orthoptists* for 1961 is now available and will be sent free to members of the medical profession, hospitals and official bodies upon application to the Registrar, Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, London, W.C.1.

OFFICIAL PUBLICATION

Drug Addiction is the recently published final report of the Interdepartmental Committee on Drug Addiction to the Minister of Health and the Secretary of State for Scotland. This shows that although the incidence of actual drug addiction in Britain is still very small and 'there is no cause to fear that any real increase is at present occurring' there has been a substantial increase during the past ten years in the prescription of potentially habit-forming drugs as distinct from those causing addiction. Barbiturates, other sedatives and hypnotics, together with analgesics and antipyretics (excluding 'dangerous drugs') accounted for no less than 19 per cent. of all prescriptions under the National Health Service during 1959: the 1959 figure for barbiturates was almost twice that for 1951. While emphasizing that such drugs have valuable medical uses, the committee recommend that further operational research into the prescribing of these drugs is desirable. (H.M. Stationery Office, price 1*s.* 3*d.*)

NOTES FROM THE CONTINENT

A European Newsletter

BELGIUM

Combined anti-cancer therapy.—'Spectacular' results are claimed by Dr. J. Henry and his colleagues, of the anti-cancer centre of the University of Brussels, from the use of combined nitrogen mustard and irradiation in the treatment of extensive carcinoma of the head and neck in 12 patients. The nitrogen mustard was given intra-arterially so as to obtain a localized regional distribution. It is claimed that marked cicatrization of the neoplasm was obtained without any serious damage to healthy tissue—and certainly much less damage than would have occurred had either sufficient nitrogen mustard or irradiation separately been used to produce the same effect as the combined therapy on the cancerous tissue.

Heart disease in schoolchildren.—A plea for the setting up of heart clinics in school clinics is made by Dr. N. Boyadjian and Dr. H. Mertens, of the Brussels public health department. They draw attention to the fact that the incidence of organic heart disease in children of school age is 3 per 1000. There are four main functions of such a clinic. The first is to advise parents on how much exercise the child can safely undertake. The second is to allow those cases to be detected which are amenable to surgery. The third is to pick out those unfortunate children in whom a false diagnosis of heart disease has been made and who are thereby being deprived of the benefits of leading a perfectly normal life. The fourth is to be able to advise parents as to what occupation the child will be physically capable of following once he leaves school.

Thymectomy in myasthenia gravis.—Professor C. Hooft and Dr. F. de Loore, of the pædiatric clinic of the University of Ghent, report a successful case of thymectomy in a 13-year-old girl with myasthenia gravis. During the previous ten months, in spite of full doses of neostigmine (100 mg. daily) and of pyridostigmine (up to 1,980 mg. daily) the child had had six serious myasthenic crises, in four of which artificial respiration had been required. Immediately following the operation it was possible to start reducing the dose of pyridostigmine until it was stopped entirely at the end of five months. By this time all signs and symptoms of myasthenia had disappeared and the child was leading a normal life.

Surgery of coronary disease.—A detailed study of the results of ligation of the internal mammary artery in 35 cases of coronary disease has been published by W. Cloetens and D. de Mey, of the section of cardiology of the department of internal medicine in the Hôpital Civil d'Anderlecht, Brussels. Most of their patients had been selected for operation on the grounds that (a) it was several years since they had had a myocardial infarction, (b) their electrocardiograms were stable, (c) there were 'cardiovascular symptoms'—usually a slight degree of cardiac insufficiency. They claim that the results were 'excellent' in 23% of cases, 'satisfactory' (i.e. definite improvement) in 51%, and no improvement in 26%.

On the controversial subject of whether there is any rational basis for this operation they report experiments purporting to show an anastomosis between the pericardiacophrenic branch of the internal mammary artery and the coronary circulation. Admittedly, this anastomosis is small—in the region of 1 or 1.5 ml.—but, on the grounds that it only requires 4 to 6 ml. of fluid to fill the whole of the coronary circulation experimentaly, it is claimed that even this small amount of extra blood may make quite a difference. This *modus operandi*, 'although hypothetical', is claimed to be the most plausible in our present state of knowledge.

GERMANY

PHYSICIANS, surgeons, cardiologists and nutritionists have all been meeting in solemn conclave, and the following are some of the gleanings from this wealth of learned disputation.

Closed head injuries.—Road accidents were a dominant theme among the surgeons. In a paper on closed head injuries emphasis was laid upon the importance of correct positioning of the patient, with immediate removal of any mechanical obstruction to respiration, removal of secretion by suction, and combating of shock. Epidural hæmatomas, it was recommended, should be drained as soon as possible, whilst

urea infusions have proved valuable in the lowering of intracranial pressure. Infections must be controlled by antibiotics.

Clinical diagnosis of heart disease.—Among the more interesting papers read at the congress of physicians was one demonstrating that a large proportion of cases of congenital and acquired defects of the heart can be diagnosed by simple clinical methods. Thus, of 2,850 cases at Düsseldorf, the diagnosis was established in 2000 without recourse to special investigations. As a rule, special investigations are only required if the question of surgical intervention is being considered.

Dangers of modern therapy.—German clinicians are just as worried as their British colleagues about the hazards of modern therapeutic agents. Several suggestions were put forward for dealing with this problem. One was that a law should be introduced making it compulsory that new drugs should be available only on prescription when first introduced. Another was that a central office should be established, to which all toxic effects arising during the course of drug therapy should be reported. Finally, an appeal was made to the editorial boards of medical journals to devote adequate space in their journals to discussing such toxic effects.

Dr. Hoff, of Frankfurt-am-Main, who was elected president of the Congress of Physicians for 1962, while paying tribute to the 'astounding progress' that had been achieved in the treatment of hitherto incurable diseases, noted the possibilities for harm that seemed to be so inherent in so many of these new remedies. In this connexion he noted especially hormones, antibiotics, psychopharmacological drugs and cytostatics. He drew attention to the fact that a book had recently been published in Germany, in which 1,300 pages were devoted to an account of the side-effects of drugs. How often, he asked, did a 'drug fever' lead to a misdiagnosis of glandular fever or lymphogranulomatosis? As an example of the care required nowadays in excluding drugs as a cause of disease, he quoted the necessity of inquiring in every case of ulcerative colitis whether the patient had been taking an antibiotic and, if so, which. In his opinion, it is often more important today to stop giving a drug rather than to prescribe one. Finally, he issued a warning against the 'desire for tablets' of modern man, and urged that steps should be taken to educate the populace —and doctors—in such matters.

Digitalis therapy.—An entire paper was devoted to the side-effects of cardiovascular drugs—and particularly digitalis. One piece of advice is more applicable to the Continent where the unfortunate practitioner is inundated with an almost bewildering variety of digitalis glycosides, whereas most of us in Britain have been well brought up in this respect and realize that digitalis leaf is satisfactory in the vast majority of patients requiring the oral administration of digitalis. The advice given to the German practitioner in this respect is that he should adhere to one glycoside and so get to know its action. Of more general application is the warning that underdosage of digitalis is more common than overdosage, and that many of the symptoms and signs, such as nausea, attributed to digitalis are actually manifestations of congestive heart failure and therefore an indication for increasing the dose of digitalis. Resistance to digitalis is almost unknown except in the preterminal stages of heart failure and in cases of cor bovinum. Stress was laid upon the need for increased doses of digitalis in thyrotoxicosis, high fever and when the heart was hypertrophied. Attention was drawn to two hazards of digitalis therapy that tend to be overlooked. One is that digitalis toxicity can be enhanced by adrenaline and its derivatives and what is forgotten is that these are often present in antiasthmatic preparations. The other is that calcium acts synergistically with digitalis.

Nutrition in the elderly.—At a joint-meeting of physicians and nutritionists a warning was given against overloading the elderly with calories. Over the age of 40, an adult should start to cut down his intake. The aim should be a diet poor in calories and fat, and comparatively rich in protein, vitamins and mineral salts. So far as the fat intake is concerned, it was recommended that this should contain 50% of unsaturated fatty acids.

Bile as a hypotensive.—In a paper on 'experiments on the hypotensive effects of bile and its various constituents', Daniel, of Paris, recalled that some thirty years ago he and his colleagues had expressed the opinion that certain forms of hypertension were accompanied by marked disturbances of hepatic function, particularly so far as bile was concerned. Following up this clue, he reported experiments which purported to show that bile contains a hypotensive dialysable substance. Although not as yet identified, this substance appears to be different from hitherto recognized constituents of bile.

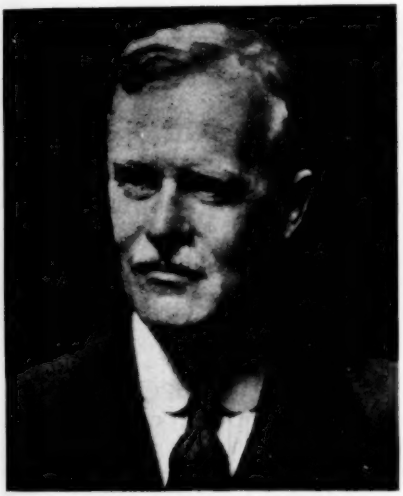
'Notes from the Continent' are produced in collaboration with the Editors of *Bruxelles-Médical* (Belgium), *Le Concours Médical* (France), *Munchener Medizinische Wochenschrift* (Germany), and *Minerva Medica* (Italy).

THE PRACTITIONER
Fifty Years Ago

JULY 1911

'Be not the first by whom the new are tried,
Nor yet the last to lay the old aside'.
Alexander Pope: *Essay on Criticism*, I.335.

IN a clinical lecture on 'Renal adenomata' Sir Henry Morris, Bt, M.A., M.B., F.R.C.S., Emeritus Lecturer on Surgery at the Middlesex Hospital Medical School, warns: 'There is no dependence to be placed upon simple adenoma of the kidney remaining simple; and as it may develop into carcinoma, the possibility of this transition occurring is a reason for removing these growths even though they cause no hæmaturia, pain, or prejudicial pressure effects'.



James Hugh Thursfield, M.D., F.R.C.P
(1870-1944)

'The more we know about tuberculous disease in all its aspects', writes David Newman, M.D., F.R.F.P.S.G., Surgeon to the Glasgow Royal Infirmary, in 'The surgical aspects of early renal tuberculosis', 'the greater is the tendency to believe in the possibility of spontaneous cure'. In the very early stages, especially, the surgeon is in difficulty, for not only is there 'pathological evidence that the progress of renal tuberculosis becomes arrested, but also clinical proof that under favourable circumstances a patient may make a complete recovery. Unfortunately it is also true that a large proportion of these sufferers if not saved by operative interference go on from bad to worse'.

'To lower arterial hypertension for any length of time by the administration of drugs of the depressor group, by purgatives, or a strict vegetarian diet is both futile and unscientific', according to Leslie Thorne Thorne, M.D., B.S., Etc., Late Medical Examiner, London County Council Technical Education Board, in an article on 'The Treatment of Cases of Arterial Hypertension'. 'In people who have passed middle age the symptoms of cardiac inadequacy are usually only manifested after many years of gradually increasing arterial tension, and it is these symptoms which are often treated with cardiac depressors, under the mistaken belief that if the high tension can be lowered the symptoms will be alleviated'. 'The only treatment' that he has found of 'any lasting value in this class of case is the administration of a course of mineral baths prepared artificially so as to resemble, in all active ingredients, the natural baths of Nauheim'. This treatment he combines with a low carbohydrate diet and, in addition, 'a definite amount of physical exercise is prescribed if the patient is in a fit condition to take it'.

'No one should bathe when under the influence of great emotion or excitement', according to A. H. Copeman, M.D., Brighton, in an article on 'Sea-Bathing'. The best time to bathe is about two hours after breakfast—'the period of greatest vital activity'. 'With many keen bathers it is an article of faith to bathe before breakfast; but business men after months of unremitting toil, those who are below par, or who are getting on in years, should avoid taxing their system by bathing at such a time'. 'The ordinary means of bathing,' he comments, 'is from a machine, a contrivance which has not progressed in luxury or convenience with the lapse of time'. Of 'bathing suits' he has this to say: 'They should be made of some woollen material, preferably flannel. Non-swimmers should have the sleeves long enough to reach the wrists, and the drawers to cover the knees, as a protection from sunburn . . . Swimmers, for the sake of freedom, should have short sleeves, and drawers ending above the knees'.

Hugh Thursfield, M.D., F.R.C.P., Assistant Physician, The Hospital for Sick Children, Great Ormond Street, begins his 'Review of children's diseases' by examining the status of

'606' in the treatment of children, concluding: 'It is probably too early as yet to assert a superiority of results from "606" over the old mercurial treatment for congenital syphilis'. Should its efficiency be established 'its superior cleanliness and rapidity of action will undoubtedly cause it to displace the older mercurial treatment altogether'.

James Hugh Thursfield secured a first class in Mods and a 2nd in Greats at Trinity College, Oxford, before beginning his medical studies at St. Bartholomew's Hospital. Demonstrator in morbid anatomy at St. Bartholomew's, he collaborated with W. P. S. Branson in a work on 'Medical Morbid Anatomy and Pathology', 1909. Thursfield obtained the Oxford M.A. in 1897, the M.D. in 1899, and became F.R.C.P. in 1906. No vacancy occurred on the senior staff at St. Bartholomew's before he reached the retiring age, but he found great satisfaction in his work at The Hospital for Sick Children, Great Ormond Street, where he was appointed physician in 1920. Thursfield left his impress on pædiatric literature as a co-editor of the classic Garrod, Batten and Thursfield's 'Diseases of Children', and of *Archives of Disease in Childhood*, with which he was associated from its foundation in 1926 and which he helped to make an organ famous for publication of original work in pædiatrics. Moving from London to Basingstoke at the age of 66, he became physician to the Park Prewett E.M.S. Hospital during the 1939-45 War, and it was here that he died following an attack of pneumonia in 1944. Thursfield was remarkable for his erudition and equanimity, qualities which endeared him to colleagues young and old. His knowledge could be described as encyclopædic without abuse of that over-worked word. Extra-medical interests ranged from bird lore to a deep appreciation of red wines.

In 'Pallor—its clinical significance', Gordon R. Ward, M.B., B.S., Resident Medical Officer to the West End Hospital for Nervous Diseases, alludes to 'asthenia scriborum': 'the condition of ill-health seen in those whose time is spent in city offices, and whose food is that of city restaurants, often inadequate and too quickly eaten'.

This, of course, was the heyday of spas and 'waters', and 'Preparations, Inventions, etc.' this month includes the following note on 'Presler Water': 'The artesian well that supplies this water is situated at Eger in Hungary and is over 740 feet deep. An interesting fact in regard to its composition is that the amount of salt is small. The colour of the water is slightly yellowish and it is well described as "crystal clear". It is almost needless to point out the value of Presler water in glandular affections, whilst in specific cases its therapeutic uses are manifest. Its curative powers in skin diseases place it among the most beneficial of its class'.

T. H. B.

Diet and antenatal care

During pregnancy nutritional deficiencies which may normally pass undetected are liable to produce frank clinical symptoms, as all demands on the maternal organism are increased. Thus fissures at the angles of the mouth may indicate an inadequate supply of vitamins of the B complex, particularly riboflavin. Special attention to the diet is therefore an important part of antenatal care.

Marmite yeast extract is a useful source of all known factors of the vitamin B complex. It is easily incorporated in the diet, as it can be added to soups, stews and other savoury dishes, or spread on bread and butter or hot toast, or taken as a drink in hot water or milk.

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